Designation: E 1990 – 98

Standard Guide for Performing Evaluations of Underground Storage Tank Systems for Operational Conformance with 40 CFR, Part 280 Regulations[1]

This standard is issued under the fixed designation E 1990; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers information for evaluating tank systems for operational conformance with the Federal technical standards (including the financial responsibility requirements) for underground storage tanks (USTs) found at 40 Code of Federal Register (CFR) Part 280.

1.2 This guide does not address the corrective action requirements of 40 CFR Part 280.

1.3 To the extent that a tank system is excluded or deferred from the federal regulations under Subpart A of 40 CFR Part 280, it is not covered by this guide.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *Federal Standards:*

Title 40 Code of Federal Regulations (CFR), Environmental Protection Agency, Part 280, Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)[2]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *corrosion protection*—to prevent the degradation of a material due to a reaction between the material and its environment.

3.1.2 *implementing agency*—Environmental Protection Agency (EPA), or, in the case of a State with program approval (or pursuant to a memorandum of agreement with EPA), the designated State or Local agency responsible for carrying out the UST program.

3.1.3 *overfill*—exceeding the capacity of the tank.

3.1.4 *overfill protection*—a device used to prevent a tank from being overfilled when product is being added to the tank.

3.1.5 *release detection*—a method to determine whether a release of a regulated substance has occurred from the UST system into the environment or into the interstitial space between the UST system and its secondary barrier or secondary containment around it.

3.1.6 *spill*—to cause or allow product to enter the environment that was intended to be placed in the tank.

3.1.7 *spill prevention*—a device used to prevent or contain a spill associated with removing the fill hose from the tank fill pipe.

3.1.8 *suspected release*—released product discovered at or near the UST site, observed unusual operating conditions, such as apparent loss of product; or results from a release detection method that indicates a release. Suspected release does not include situations where a method or equipment is found to be defective, is immediately corrected, and then indicates no release.

3.1.9 *underground storage tank (UST)*—any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including connected underground piping) is 10 % or more beneath the surface of the ground.

3.1.9.1 *existing tank*—a tank where installation began on or before 12/22/88.

3.1.9.2 *new tank*—a tank where installation started after 12/22/88.

3.1.10 *upgrade*—the addition or retrofit of the UST system or some system components such as release detection, corrosion protection, spill prevention, or overfill protection to improve the ability of an UST system to prevent the release of product and meet the requirements of 40 CFR Part 280.

3.1.11 *UST system*—an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any.

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[1] This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment and is the direct responsibility of Subcommittee E50.05 on Wetland Ecosystems.

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[2] Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

3.2 *Additional Terminology*—The following definitions and discussions, taken directly from the publication "Form and Style for ASTM Standards" shall be included in full in every standard guide or practice produced and passed by Committee E-50 or any of its technical subcommittees, approved April 16, 1997.

3.2.1 *guide*—a series of options or instructions that do not recommend a specific course of action.

3.2.1.1 *Discussion*—Whereas a practice prescribes a general usage principle, a guide only suggest an approach. The purpose of a guide is to offer guidance, based on a consensus of viewpoints, but not to establish a fixed procedure. A guide is intended to increase the awareness of the user to available techniques in a given subject area and to provide information from which subsequent evaluation and standardization can be derived.

3.2.2 *practice*—a definitive procedure for performing one or more specific operations or functions that does not produce a test result.

3.2.2.1 *Discussion*—A practice is not a downgraded test method. Examples of practices include procedures of interlaboratory testing programs or other statistical procedures; for writing statements on sampling or precision and accuracy; and for selection, preparation, application, inspection, and necessary precautions for the use, disposal, installation, maintenance, and operation of testing equipment.

3.2.3 *standard*—as used in ASTM, a document that has been developed and established within the consensus principles of the Society and that meets the approval requirements of ASTM procedures and regulations.

3.2.3.1 *Discussion*—The term "standard" serves in ASTM as an adjective in the title of documents such as test methods or specifications, to connote specified consensus and approval. The various types of standard documents are based on the needs and usages as prescribed by the technical committees of the Society.

4. Significance and Use

4.1 This guide is an educational tool for tank owners, operators, and other users and is not intended for use in certifying compliance with the Federal technical standards for underground storage tanks.

4.2 The intent of this guide is to provide an overview of the general requirements. This guide is intended for users who are generally familiar with the requirements of 40 CFR Part 280. The user is advised that this guide does not contain the level of detail necessary to make the determination of whether specific equipment or services meet the detailed technical performance requirements of 40 CFR Part 280.

4.3 This guide does not cover state and local requirements, that can be more stringent than the federal rules. Owners and operators are responsible for meeting federal, state, and, in some circumstances, local requirements. It is recommended that owners and operators familiarize themselves with these requirements as well.

4.4 Owners or operators may use the sample checklist in Appendix X1 to assist them in determining operational conformance or they may develop their own checklist based upon this guide.

4.5 This guide and accompanying appendixes are not intended to be used by state or local UST program authorities as a regulatory or administrative requirement for owners or operators. Use of this guide and appendixes by owners and operators is intended to be a voluntary educational tool for the purposes described in 4.1.

5. UST System Requirements

5.1 *Operational Conformance*—For an underground storage tank (UST) system to be in operational conformance with 40 CFR Part 280, it must have release detection, corrosion protection, spill prevention, and overfill protection.

5.2 *Release Detection*—To meet all release detection requirements, release detection for both tank and piping is required.

5.2.1 *Petroleum Tanks*— These tanks may meet release detection requirements by use of one of the following:

5.2.1.1 Monthly monitoring using one of the following: automatic tank gaging, vapor monitoring, interstitial monitoring, ground water monitoring, statistical inventory reconciliation (SIR), and any other approved method

5.2.1.2 Monthly inventory control and annual tank tightness testing (may be used for existing UST systems which have not been upgraded to meet Federal regulations at 40 CFR Part 280.21).

5.2.1.3 Monthly inventory control and tank tightness testing every five years (may start when new UST systems and UST systems that have been upgraded with spill prevention and overfill and corrosion protection meet the Federal regulations at 40 CFR Part 280.20 or 280.21). This release detection method must be replaced or augmented with one of the options in 5.2.1.1 at the later of two dates—December 22, 1998 or ten years after the tank was installed or upgraded with corrosion protection.

5.2.1.4 *Manual Tank Gaging*—This release detection method is for tanks of 2000-gal capacity or less. This technique may be used if the tank meets the size, test duration, and standard variation requirements listed in Table 1:

5.2.2 *Piping*—Piping may meet release detection requirements by use of one of the following:

TABLE 1 Guide for Owners and Operators

Tank Size	Minimum Duration of Test, h	Weekly Standard (One Test), gal	Monthly Standard (Four-Test Average), gal
Up to 550 gal	36	10	5
551 to 1000 gal (when the tank diameter is 64 in.)	44	9	4
551 to 1000 gal (when the tank diameter is 48 in.)	58	12	6
551 to 1000 gal (also requires periodic tank tightness testing in accordance with 5.2.1.2 and 5.2.1.3)	36	13	7
1001 to 2000 gal (also requires periodic tank tightness testing in accordance with 5.2.1.2 and 5.2.1.3)	36	26	13

5.2.2.1 *Pressurized Piping*—To meet release detection requirements for pressurized piping, it is necessary to choose one method from 5.2.2.2 and one method from 5.2.2.4 (or a single method that satisfies both sections).

5.2.2.2 Choose one of the following: automatic flow restricter, automatic shutoff device, and continuous alarm system.

5.2.2.3 Each of these methods must be tested on an annual basis in accordance with the manufacturer's requirements.

5.2.2.4 Choose one of the following: annual line tightness testing, monthly monitoring using one of the following: vapor monitoring, ground water monitoring, interstitial monitoring, SIR, other approved methods, such as: electric or electronic line leak detector, and continual reconciliation.

5.2.2.5 *Suction Piping*— For suction piping, you may choose one of the following:

5.2.2.6 Monthly monitoring using one of the following: vapor monitoring, ground water monitoring, interstitial monitoring, SIR and, other approved methods.

5.2.2.7 Line testing every three years.

5.2.2.8 No leak detection requirements if the piping meets the following criteria:

5.2.2.9 The below-grade piping operates at less than atmospheric pressure.

5.2.2.10 The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if suction is released.

5.2.2.11 Only one check valve is included in each suction line and it is located directly below and as close as practical to the suction pump.

5.2.2.12 Satisfying the preceding requirements must be able to be easily determined.

5.2.3 *Hazardous Substance Tanks*—Release detection for hazardous substance tanks must meet one of the following:

5.2.3.1 Existing UST systems

5.2.3.1.1 Until Dec. 22, 1998, existing hazardous UST systems may meet the release detection requirements as described in 5.2.1.

5.2.3.1.2 By Dec. 22, 1998, all hazardous UST systems must meet the new system requirements described in 5.2.3.2.

5.2.3.2 New UST systems

5.2.3.2.1 Unless an owner or operator has applied for and received a variance from the implementing agency, new hazardous substance UST systems must have each of the following: secondary containment, and monthly interstitial monitoring.

5.3 *Corrosion Protection*—All underground tanks and piping must be protected from corrosion.

5.3.1 *Tanks*—Any portion of the tank that is underground and routinely contains product must have corrosion protection. The following may be used to meet corrosion protection requirements for tanks:

5.3.1.1 Coated and cathodically protected steel,

5.3.1.2 Cathodic protection added,

5.3.1.3 Interior lining added,

5.3.1.4 Cathodic protection and interior lining added,

5.3.1.5 Fiberglass reinforced plastic,

5.3.1.6 Steel tank clad with a noncorrodible material, and

5.3.1.7 Other construction accepted by the implementing agency.

5.3.1.8 Corrosion expert's determination that the site is not corrosive enough to cause it to have a release during the operating life of the tank.

5.3.2 *Piping*—Piping that routinely contains regulated substances and is in contact with the ground must be protected from corrosion. The following may be used to meet corrosion protection requirements for piping:

5.3.2.1 Coated and cathodically protected steel,

5.3.2.2 Cathodic protection added,

5.3.2.3 Fiberglass reinforced plastic,

5.3.2.4 Other construction accepted by the implementing agency, and

5.3.2.5 Corrosion expert's determination that the site is not corrosive enough to cause it to have a release during the operating life of the piping.

5.4 *Spill Prevention and Overfill Protection*—Tanks that received regulated substances in quantities greater than 25 gal at one filling need to have spill prevention and overfill protection.

5.4.1 To meet the spill prevention requirement, equipment that will contain the product in the transfer hose when the transfer hose is detached from the fill pipe (for example, a catchment basin) must be used to prevent release of product to the environment.

5.4.2 To meet overfill protection requirements, one of the following must be used:

5.4.2.1 Automatic shutoff device,

5.4.2.2 Overfill alarm, and

5.4.2.3 Ball float valve.

6. Financial Responsibility

6.1 *Financial Responsibility*—Owners or operators of USTs which hold petroleum must demonstrate financial responsibility. These requirements are designed to ensure that someone can pay the costs of cleaning up leaks and compensating third-parties for bodily injury and property damage caused by leaking USTs. The total amount of coverage required under the federal rule is determined by the type of business, the amount of throughput of the tanks at a facility, and the number of tanks owned nationwide. The amount of coverage that an owner must demonstrate may be changed due to coverage provided by a state financial assurance fund. The following mechanisms may be used to meet the financial responsibility requirements:

6.1.1 Insurance policy,

6.1.2 Guarantee,

6.1.3 Letter of credit,

6.1.4 Self insurance.

6.1.5 State financial assurance fund,

6.1.6 Surety bond,

6.1.7 Dedicated trust fund, and

6.1.8 State approved method.

6.1.9 The following four additional mechanisms may be used by local governments to demonstrate compliance:

6.1.9.1 Bond rating test,

6.1.9.2 Passing a financial test,

6.1.9.3 Guarantee, and

6.1.9.4 Dedicated fund.

7. Notification, Reporting, and Recordkeeping

7.1 *Notification*— The following are notification requirements listed in the underground storage tank technical requirements at 40 CFR Part 280. This information must be submitted to the implementing agency.

7.1.1 *Notification for All UST Systems*—If an UST system is brought into use after May 8, 1986, within 30 days of being brought into use a notification form must be submitted. If an UST system was in the ground on or after May 8, 1986, unless taken out of operation on or before Jan. 1, 1974, a notification form must be submitted. If an UST system was installed after Dec. 22, 1988, a certification of installation must also be submitted for that system.

7.1.2 *Notification Before Permanent Closure or Change in Service*—Owners or operators must notify the implementation agency at least 30 days before permanent closure or change in service begins.

7.2 *Reporting*—The following are reporting requirements listed in the underground storage tank technical requirements at 40 CFR Part 280. This information must be submitted to the implementing agency.

7.2.1 *Reports of All Releases*—Within 24 h or another reasonable time period established by the implementing agency, the following must be reported:

7.2.1.1 Suspected releases,

7.2.1.2 Spills and overfills (if not cleaned up within 24 h, if petroleum over 25 gal or if a hazardous substance over its reportable quantity under 40 CFR Part 302), and

7.2.1.3 Confirmed releases.

7.2.2 *Corrective Actions Planned or Taken*—This includes:

7.2.2.1 Initial abatement measures,

7.2.2.2 Initial site characterization,

7.2.2.3 Free product removal,

7.2.2.4 Investigation of soil and ground water cleanup, and

7.2.2.5 Corrective action plan.

7.3 *Recordkeeping*— The following are recordkeeping requirements listed in the underground storage tank technical requirements at 40 CFR Part 280.

7.3.1 *Corrosion Expert's Analysis*—A corrosion expert's analysis of site corrosion potential if corrosion protection equipment is not used.

7.3.2 *Corrosion Protection*—Documentation of operation of corrosion protection equipment is required. This includes the following:

7.3.2.1 Results from the last two tests for proper operation for all cathodic protection systems. These tests are required within six months of installation and every three years thereafter. In addition, this test must be conducted within six months following the repair of any cathodically protected UST system. The test must be done by a qualified cathodic protection tester.

7.3.2.2 Results from the last three inspections for UST systems having an impressed current cathodic protection system. These inspections must be conducted every 60 days to ensure that the equipment is running properly. This inspection may be performed by the owner or operator of the system.

7.3.3 *Release Detection*—Records showing conformance with release detection requirements are required. This includes the following:

7.3.3.1 All written performance claims pertaining to the release detection system used and the manner in which these claims have been justified or tested by the vendor or by the equipment manufacturer or installer. These records need to be maintained for five years from the date of installation.

7.3.3.2 The results of any sampling, testing, or monitoring. These results must be maintained for one year. In the case of tank tightness testing, the result must be maintained until the next tightness test is conducted.

7.3.3.3 Written documentation of all calibrations, maintenance, and repair of release detection permanently located on-site. This documentation needs to be maintained for at least one year after the servicing work is completed. In addition, any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for five years from the date of installation.

7.3.4 *UST System Repairs*—Documentation of UST System Repairs must be maintained for each repair for the remaining operating life of the UST system.

7.3.5 *Permanent Closure Site Assessment*—Results of the site assessment conducted at permanent closure must be maintained for at least three years after completion of the permanent closure or change-in-service.

7.3.6 *Evidence of Financial Assurance*—The following is needed to demonstrate financial assurance:

7.3.6.1 A current "Certification of Financial Responsibility" and

7.3.6.2 Any additional documentation that shows the financial responsibility method is valid and provides details on the method's coverage such as signed copies of official letters or newsletters, policies, and state fund agreements.

7.4 *Availability and Maintenance of Records*—Records listed in 7.3 must be kept in accordance with one of the following:

7.4.1 Records may be kept at the UST site and be immediately available for inspection.

7.4.2 Records may be kept at a readily available alternative site and be provided for inspection upon request.

7.4.3 For permanent closure, records may be mailed to the appropriate implementing agency if they cannot be kept at the site or at an alternative site.

8. Appendixes

8.1 Tank owners and operators may use the following appendixes to assist them in determining the operational conformance status of their UST systems.

8.1.1 *Appendix X1*—A sample underground storage tank evaluation checklist that contains all the basic elements described here in a format that is easy and simple to use.

8.1.2 *Appendix X2*—General instructions for completing the sample checklist.

APPENDIXES

(Nonmandatory Information)

X1. SAMPLE UNDERGROUND STORAGE TANK EVALUATION CHECKLIST

FACILITY INFORMATION	PREPARER
Identification #:	Name:
Name:	Phone #:
Address:	Address:
DATES OF EVALUATION:	

THE FOLLOWING SUMMARIZES FEDERAL REPORTING AND RECORDKEEPING REQUIREMENTS*

	(Y=Yes/N=No/NA=Not Applicable)
1. Do you have evidence of Financial Responsibility?	
2. If you have had a release or suspected release, did you submit the appropriate reports?	
3. Do you have the tank closure reports? (Required to be kept for 3 years)	
4. Have you submitted the current UST notification forms to the appropriate authority?	
5. Do you have records of all UST system repairs? (Must be kept for the operating life of the UST system)	
6. **Release Detection Recordkeeping:**	
a. Do you have documentation showing the results of any sampling, testing, or monitoring of release detection? (These records must be kept for 1 year **except** for the results of tank tightness testing which must be retained until the next test is conducted.)	
b. Do you have records of calibration, maintenance, and repair of release detection equipment? (These records must be kept for 1 year, except for schedules of required calibration and maintenance which need to be kept for 5 years from the date of installation.) If you use manual tank gauging or inventory control and tank tightness testing, put NA in this box.	
c. Do you have all the written performance claims pertaining to any release detection method you use? (These claims must be kept for 5 years.) If you use manual tank gauging as sole method, put NA.	
d. Do you have documentation showing that the release detection method you are using was evaluated by a 3rd party using EPA protocols? If you use manual tank gauging as sole method, put NA.	
7. **Cathodic Protection (steel tanks and metal piping):**	
a. Do you have the paperwork from the installer for your cathodic protection system?	
b. Do you have the documentation of the last two cathodic protection test results? These tests are required within 6 months of installation, within 6 months of a repair, and then at least every 3 years.	
c. If you have an impressed current system, do you have documentation of the last three rectifier readings? Readings are required every 60 days and may be taken by the owner or operator.	

***State and Local Jurisdictions may have additional requirements. This information assists in demonstrating conformance. However, the unavailability of records does not necessarily indicate operational non-conformance.**

FIG. X1.1 Sample Underground Storage Tank Evaluation Checklist

X1.1 Fig. X1.1 provides an evaluation checklist as an example of how this guide can be used by owners and operators to determine operational conformance with federal UST regulations at 40 CFR Part 280 and should not be used as a means of demonstrating compliance to an implementing agency.

X2. INSTRUCTIONS FOR COMPLETING APPENDIX X1

X2.1 Appendix X1 is a sample evaluation checklist that allows owners or operators of federally regulated underground storage tanks to determine the status of their conformance with the underground storage tank requirements. The checklist contains all of the information necessary for owners or operators to determine conformance.

X2.1.1 No special knowledge or expertise is required to fill out Appendix X1. Most, if not all of the information, should be on file at the facility. If the information is not on file at the facility, it may be able to be obtained from the vendors that provided the service. Vendors such as tank and other equipment installers, tank testers (for release detection systems), providers of corrosion protection should provide the necessary documentation when the service is provided. If not, tank owners or operators should request the appropriate documentation.

X2.2 *Specific Instructions*:

X2.2.1 *Facility Information*—Information about the facility to be evaluated is placed here. Enter the facility identification number, the facility name, and the facility address.

X2.2.2 *Preparer*—Information about the individual who performed the evaluation and completed the evaluation checklist is put in this section. Enter the preparer's name, phone number, and address. If the preparer's address is the same as in facility information, place "SAME" in the address block.

X2.2.3 *Dates of Evaluation*—Enter the date or dates when the facility was evaluated.

X2.2.4 *Summarization of the Reporting and Recordkeeping Requirements*—The questions in this section are based on the Federal regulations at 40 CFR Part 280. Please remember to check with the state and local agencies (where the tanks are located) to find out whether or not there are additional requirements. Each question should be answered with "Y" for Yes, "N" for No, or "N/A" for Not Applicable.

X2.2.5 *Question 1*— Federal regulations require that the owner or operator have evidence of financial responsibility. If unsure or want more information, see EPA Publication 510-K-950-004, "Dollars and Sense." Copies of this publication can be obtained by calling EPA's RCRA/Superfund Hotline. Information can also be obtained by accessing the Office of Underground Storage's homepage at: http://www.epa.gov/OUST.

X2.2.6 *Question 2*— Federal regulations require that, if there was a release or suspected release, the following reports must be submitted:

X2.2.6.1 An oral or written report to the implementing agency within 24 h of discovery and a follow-up report within seven days or another time period specified by the implementing agency. Reports of all releases, including suspected releases, spills, and overfills that meet the following circumstances:

X2.2.6.2 *Petroleum*—The release exceeds 25 gal or another reasonable amount specified by the implementing agency.

X2.2.6.3 *Hazardous Substance*—The release exceeds the reportable quantity described at 40 CFR Part 302.

X2.2.6.4 A spill of any amount of any substance in which the cleanup cannot be accomplished within 24-h confirmed releases.

X2.2.6.5 *Corrective Actions Planned or Taken*—Including initial abatement measures, initial site characterization, free product removal, investigation for soil and ground-water cleanup, and corrective action plan.

X2.2.7 *Question 3*— If the tanks have been permanently closed or have undergone a change-in-service, there needs to be records of the closure reports. These records need to be maintained for three years in one of the following ways:

X2.2.7.1 By the owners and operators who took the UST system out of service,

X2.2.7.2 By the current owners and operators of the UST site, and

X2.2.7.3 By mailing the records to the implementing agency if they cannot be maintained at the closed facility.

X2.2.8 *Question 4*— Notification forms for all UST systems must be submitted. This notification includes the certification of installation for new UST systems. New UST systems are those where installation began after Dec. 22, 1988. Notification forms for UST systems brought into use after May 8, 1986, need to be submitted within 30 days of bringing the UST systems into use. Owners and operators of UST systems who have not complied with the notification requirements should submit a notification form as soon as possible. Owners and operators of UST systems that were in the ground on or after May 8, 1986, unless taken out of operation on or before Jan. 1, 1974, were required to notify the designated state or local agency.

X2.2.9 *Question 5*— If the UST system has been repaired, there must be documentation of each repair. These records must be kept for the remaining operating life of the tank.

X2.2.10 *Question 6*— Regulations require that some release detection records must be kept.

X2.2.10.1 Sampling, testing, and monitoring records are those records that the owner or vendors generate that show that the UST system is not leaking. These records need to be maintained for one year except for the results of tank tightness testing which need to be maintained until the next tightness test is conducted.

X2.2.10.2 Written documentation of all calibrations, maintenance, and repair of release detection equipment permanently located on-site needs to be kept for one year after the servicing work is completed. In addition, any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for five years from the date of installation. If manual tank gaging or inventory control and tank tightness testing are used, put NA in this box because these release detection methods do not have calibrations or repairs.

X2.2.10.3 All written performance claims pertaining to any release detection system used, and the manner in which these

claims have been justified or tested by the equipment manufacturer or installer need to be maintained for five years. If manual tank gaging is used as the sole method of release detection, put NA in this box because this release detection method has no written performance claims or justifications.

X2.2.10.4 If manual tank gaging is used as the sole method of release detection, put NA in this box because this release detection method has no written performance claims or justifications.

X2.2.11 *Question 7: Cathodic Protection*—Any part of the tank that is underground and routinely contains product must be protected from corrosion. In addition, piping that routinely contains regulated substances and is in contact with the ground must be protected from corrosion. These questions apply to steel tanks and metal piping with cathodic protection.

X2.2.11.1 If the cathodic protection system was field installed, it needs to be designed by a corrosion expert. To determine whether or not the cathodic protection system was designed by a corrosion expert, look at the documentation provided when that system was installed. If there is no documentation about cathodic protection system, call the vendor who installed it. They should be able to provide the documentation. Paperwork could include such items as: design documents, installation documents, and so forth.

NOTE X2.1—A corrosion expert is a person, who by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. A corrosion expert must be accredited or certified as being qualified by NACE International (formerly National Association of Corrosion Engineers) or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

X2.2.11.2 Cathodic protection testing needs to be conducted by a qualified cathodic protection tester on all cathodic protection systems installed on UST systems. Ask the person who is conducting the cathodic protection testing whether he or she is a qualified cathodic protection tester. This testing needs to be performed within six months of installation, within six months of any repair, and then at least every three years. The purpose of the cathodic protection testing is to ensure that the cathodic protection system is protecting the tank and piping. If the cathodic protection test shows that the tank is not adequately protected from corrosion, then a professional should look at the cathodic protection system to determine the problem.

NOTE X2.2—A cathodic protection tester is a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

X2.2.11.3 If an impressed current cathodic protection system is used, it also needs to be inspected every 60 days to ensure that the equipment is running properly. The owner or operator may perform this check. Please be sure that the installer of the impressed current cathodic protection system provide instructions on how to perform this inspection and what the normal operating parameters are. The results of the last three inspections must be kept.

X2.3 *Release Detection, Corrosion Protection, Spill Prevention, and Overfill Protection* —Fig. X2.1 contains an easy-to-use checklist to determine the conformance status for each tank system at the facility.

X2.3.1 *Release Detection*—Owners and operators need to have a method of release detection for both tanks and piping. Check the appropriate box for tanks and the appropriate box for piping.

X2.3.2 *Tanks*:

X2.3.2.1 *New Tanks*—New tanks may use the combination of inventory control and tank tightness testing every five years for a period of ten years or until Dec. 22, 1998, whichever is later. After this, the owner or operator must begin using a monthly monitoring technique for release detection. If a monthly monitoring technique is used, please check the appropriate method.

X2.3.2.2 *Existing Tanks*— An existing tank may use inventory control and tank tightness testing every five years only if the upgrade of the entire tank system has been completed (that is, must have spill prevention, overfill and corrosion protection for the tank and piping). These methods may be used every five years for ten years after upgrading the tank with corrosion protection or until Dec. 22, 1998, whichever is later. After this, the owner or operator must begin using a monthly monitoring technique for release detection. If a monthly monitoring technique is used, please check the appropriate method. If any of these upgrades are missing, the combination of inventory control and annual tank tightness testing is necessary if a monthly monitoring technique is not used.

X2.3.2.3 The questions in Fig. X2.2 apply specifically to the different methods of release detection. They may be helpful in determining conformance with Federal regulations for tank release detection.

X2.3.3 *Piping*:

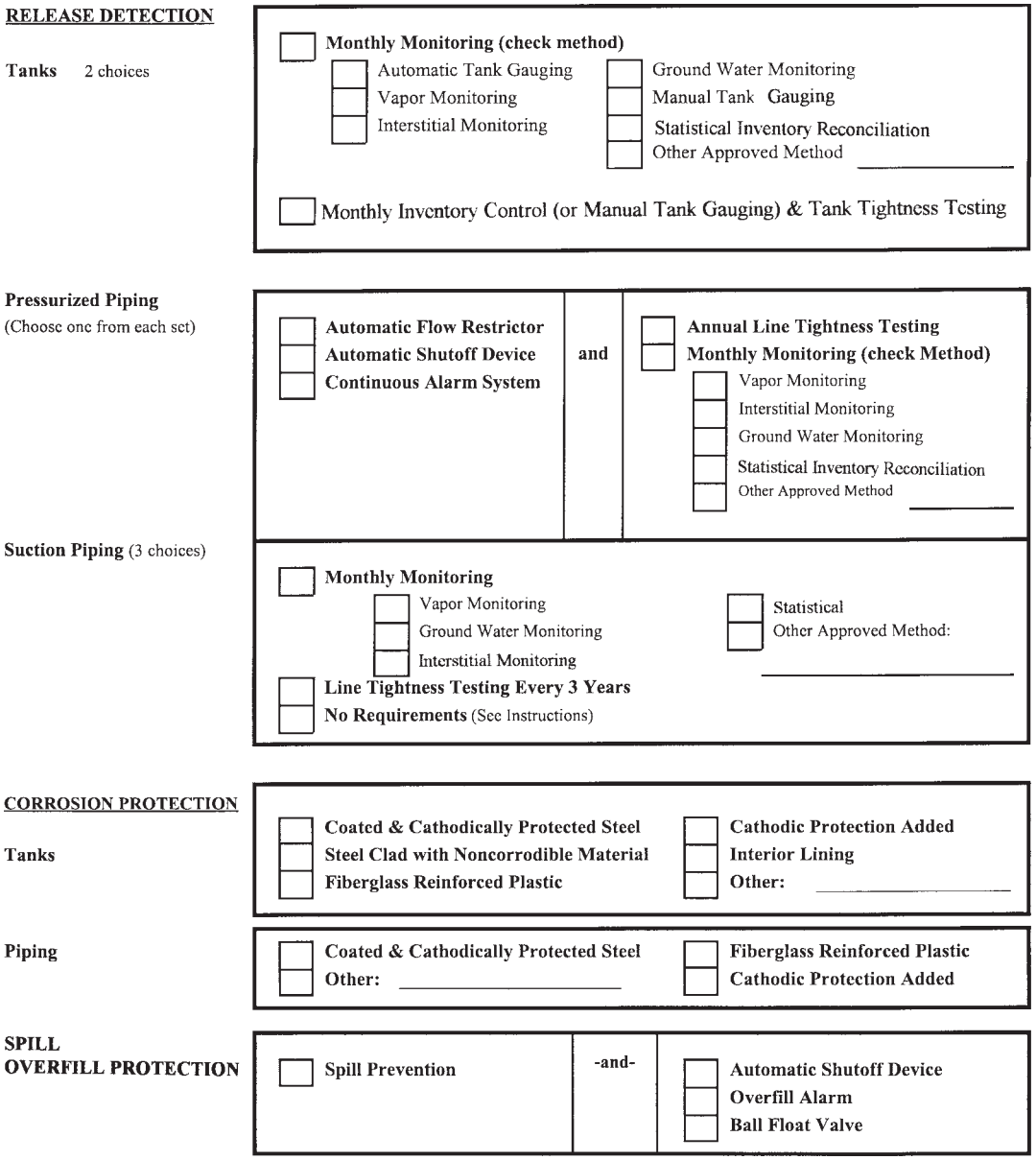
X2.3.3.1 *Pressurized Piping*—If the UST system has pressurized piping, must choose one method from each of the two sets listed on the checklist. If a monthly monitoring technique is used, please check the appropriate method. Note: Some continuous monitoring methods may satisfy both sets of requirements.

X2.3.3.2 *Suction Piping*— If the UST system has suction piping, choose one of the three choices of release detection listed in Fig. X2.2. To meet the “No Requirements” category see Fig. X2.3 on suction piping.

X2.3.3.3 If a monthly monitoring technique is used, please check the appropriate method.

X2.3.3.4 The questions in Fig. X2.3 apply specifically to the different methods of release detection. They may be helpful in determining conformance with Federal regulations for piping release detection.

X2.3.4 *Corrosion Protection*—Any part of the tank that is underground and routinely contains product must be protected from corrosion. In addition, piping that routinely contains regulated substances and is in contact with the ground must be protected from corrosion.



NOTE 1—Check appropriate choices. At least one selection in each block should be checked. Please see Appendix X2 for detailed instructions about each section. If the site has UST systems that differ in characteristics (that is, construction, piping type), use a separate sheet for each system.

FIG. X2.1 Release Detection, Corrosion Protection, Spill and Overfill Protection Checklist

X2.3.4.1 *Tanks*—There are several options to meet the corrosion protection options for the tank. Choose the appropriate option. If the tank has both cathodic protection and interior lining installed, check both boxes.

X2.3.4.2 *Piping*—There are several options to meet the corrosion protection options for the piping. Choose the appropriate option.

X2.3.4.3 The questions given in Fig. X2.4 may be helpful in determining conformance with Federal regulations for corrosion protection.

X2.3.5 *Spill/Overfill*— If the tank receives deliveries of regulated substances in quantities greater than 25 gal (L) at one filling, the tank must have spill prevention and overfill protection to meet the 1998 UST regulations. Spill equipment must contain the product in the transfer hose when the transfer hose is detached from the fill pipe (for example, a catchment basin) must be used to prevent the release of product to the environment. There are three options for overfill devices (audible or visual overfill alarm, automatic shutoff device, or ball float valve). Please check with the installer of the tank to determine whether these items are present.

				(Y=Yes/N=No/NA=Not Applicable)
INVENTORY CONTROL AND TANK TIGHTNESS TESTING				
1. Are there stick (or ATG) readings and dispenser readings each operating day?				
2. Is there an ⅛ th inch accuracy in stick or ATG readings?				
3. Are there before/after delivery stick readings reconciled with delivery receipts?				
4. Does the drop tube extend to within 1 ft of the bottom of the tank?				
5. Is the dispenser meter calibrated?				
6. Is there a check for water (⅛ th inch accuracy) at least once a month?				
7. Is monthly reconciliation (1% of volume pumped plus 130 gallons) done?				
STATISTICAL INVENTORY RECONCILIATION (SIR) If allowed in the jurisdiction.				
1. Are data collected according to the vendor's instructions?				
AUTOMATIC TANK GAUGING				
1. Are monthly leak tests conducted?				
MANUAL TANK GAUGING				
1. Is manual tank gauging performed weekly?				
2. Is the tank capacity less than 2,000 gallons?				
3. Does the tank meet one of the following tank size, duration of test, weekly standard and monthly standard requirements?				
Tank Size	Minimum Duration of Test	Weekly Standard (1 test)	Monthly Standard (4-test average)	
up to 550 gallons	36 hours	10 gallons	5 gallons	
551 - 1,000 gallons (when the tank diameter is 64″)	44 hours	9 gallons	4 gallons	
551 - 1,000 gallons (when the tank diameter is 48″)	58 hours	12 gallons	6 gallons	
551 - 1,000 gallons (also requires periodic tank tightness testing per 5.2.1.2 and 5.2.1.3)	36 hours	13 gallons	7 gallons	
1,001 - 2,000 gallons (also requires periodic tank tightness testing per 5.2.1.2 and 5.2.1.3)	36 hours	26 gallons	13 gallons	
4. Is there an ⅛ th inch accuracy in stick readings?				
5. Are 2 stick readings averaged both before and after the test?				
6. Was the test length appropriate for the tank size (minimum of 36 hours)?				
INTERSTITIAL MONITORING				
1. Is the interstitial area monitored monthly?				
2. Are the monitoring wells (secondary barriers) or ports clearly marked and secured?				
3. Is the secondary barrier compatible with the stored substance and impermeable?				
4. Is continuous monitoring used as a line leak detector?				
GROUND WATER AND VAPOR MONITORING				
1. Is there a site evaluation that the chosen method will work for the location and are the wells located according to the plans?				
2. Are the wells clearly marked and secured?				

FIG. X2.2 Questions for Tank Release Detection

(Y=Yes/N=No/NA=Not Applicable)
PIPING RELEASE DETECTION SYSTEMS - PRESSURIZED PIPING
Are one of the following two options (some continuous monitoring methods can satisfy both parts of each option) used: 1. Automatic shut-off device or flow restrictor or continuous alarm **and** annual tightness testing. 2. Automatic shut-off device or flow restrictor or continuous alarm **and** one of the following monthly monitoring techniques: interstitial monitoring, vapor monitoring, ground water monitoring or other approved methods such as electronic or electric line leak detector, continual reconciliation, or SIR.
PIPING RELEASE DETECTION SYSTEMS - SUCTION PIPING
Is one of the following three options being used? 1. Monthly monitoring: interstitial monitoring, vapor monitoring, ground water monitoring, SIR or other approved method. 2. Line tightness testing every 3 years, 3. No requirements if **all** of the following criteria are met: - the below-grade piping operates at less than atmospheric pressure. - the below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released. - there is only one check valve included in each suction line. - the check valve is located directly below and as close as practical to the suction pump. - compliance with the above specifications can be readily determined.

FIG. X2.3 Questions for Piping Release Detection

	(Y=Yes/N=No/NA=Not Applicable)
TANK ASSESSMENT	
Did the tank pass an assessment prior to upgrading with corrosion protection? Existing metal tanks need to be assessed prior to adding corrosion protection.	
CATHODIC PROTECTION	
Do the 60 day inspections indicate that the impressed current cathodic protection system is operating properly? The person who installed the cathodic protection system should have provided information on how to perform these inspections and the normal operating range for the rectifier. If this information about the rectifier is unknown or missing, contact the company who installed the system to obtain the information.	
Is the structure to soil potential equal to or more negative than -.85 volts or is the cathodic protection shown to be operating properly using another accepted method such as those listed by NACE International Recommended Practice RP0285? These checks need to be performed within 6 months of installation, 6 months of repairs, and then every 3 years thereafter. If the tank is not adequately protected from corrosion, a professional has to come out and take a look at the cathodic protection system.	
INTERIOR LINING (Tank Only)	
Was tank lined using a nationally recognized standard? If unsure, the installer should be able to answer this question.	
Has the lining been inspected within 10 years of installation and every 5 years thereafter? Metal tanks where interior lining is the only corrosion protection upgrade need to be periodically inspected the make sure that the tank is structurally sound and that the lining is still performing according to original design specifications.	

FIG. X2.4 Questions for Corrosion Protection