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Standard Guide for Performing Evaluations of Underground Storage Tank Systems for Operational Conformance with 40 CFR, Part 280 Regulations¹

This standard is issued under the fixed designation E1990; 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 *overflow*—exceeding the capacity of the tank.

3.1.4 *overflow 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 overflow protection to improve the ability of an UST system to prevent the release of product and meet the requirements of 40 CFR Part 280.

¹ This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.01 on Storage Tanks.

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

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

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 compendium of information or 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 set of instructions 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. Further examples of practices include but are not limited to: application, assessment, cleaning, collection, decontamination, inspection, installation, preparation, sampling, screening, and training.

3.2.3 *standard*—as used in ASTM International, a a nominative 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 International as a nominative 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 XI** 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 gauging, 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 Gauging*—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:

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).

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

5.2.2.2 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

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

(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

(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.

5.4.3 *Compatibility*—owners and operators of USTs are required to use UST systems made of or lined with materials that are compatible with the substance stored in the UST system (40 CFR 280.32). In accordance with the EPA Office of Underground Storage Tanks June 2011 guidance, tank owners may demonstrate compatibility of UST system equipment by using components that are certified by the manufacturer or listed by a nationally recognized, independent testing laboratory for use with the fuel stored.

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.

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[ASTM E1990-14](#)

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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.