

SECTION IV

MANAGING UNDERGROUND STORAGE TANKS RCRA SUBTITLE I

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under CERCLA §101(14), and petroleum. In other words, the federal UST regulations apply only to USTs storing either petroleum or hazardous substances. Underground tanks holding nonhazardous substances, such as water, are not covered by these regulations.

The vast majority of USTs store petroleum products at retail establishments, such as gas stations, and at petroleum refining facilities. Less than three percent of USTs store hazardous substances. Placing tanks underground minimizes hazards and provides a convenient place to store liquid materials while hiding unsightly equipment. These tanks are found at a variety of locations, including convenience stores, airports, service stations, small and large manufacturing facilities, and government facilities. USTs at these sites are used primarily to store gasoline, diesel fuel, crude oil, hazardous chemicals, and heating oil. Many of these tanks are made of bare, unprotected steel, causing them to pose a substantial threat to

OVERVIEW

Across the United States, there are approximately one million federally regulated **underground storage tanks** in use that store petroleum or hazardous substances. An UST is defined as a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. This definition includes the tank, connected underground piping, any underground ancillary equipment, such as valves and pumps, and containment systems. Therefore, aboveground tanks with extensive underground piping may meet the definition of an UST. In order for a tank to meet the definition of an UST it must also contain a regulated substance. A **regulated substance** is any **hazardous substance**, defined

WHAT IS AN UST?

An UST is defined as a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. This definition includes the tank, connected underground piping, any underground ancillary equipment, such as valves and pumps, and containment systems.

WHAT IS A REGULATED SUBSTANCE?

A regulated substance is defined as any hazardous substance, defined under CERCLA §101(14), and petroleum.

human health and the environment from leaking due to faulty installation, corrosion, tank or pipe rupture, or spills.

With over 50 percent of the U.S. population relying on ground water as their primary source of drinking water, Congress acted to protect this resource in 1984 by adding Subtitle I to RCRA in 1984. Under this Congressional mandate, EPA was required to develop a comprehensive regulatory program for USTs storing petroleum or regulated hazardous substances. In 1988, EPA published regulations that require owners and operators of new tanks and tanks already in the ground to prevent, detect, and clean up releases. In 1986, Congress amended Subtitle I with the passage of the Superfund Amendments Reauthorization Act (SARA) by creating a fund for corrective action for petroleum releases from USTs; this fund is referred to as the Leaking Underground Storage Tank (LUST) Trust Fund.

This section describes the UST program regulatory requirements, the role of the states in implementing the program, and the LUST Trust Fund.

SCOPE OF THE UNDERGROUND STORAGE TANK PROBLEM

Of the one million tanks currently in use and subject to the federal regulations, less than half are believed to be made of unprotected bare steel, which can corrode, allowing contaminants to seep into the ground and threaten the environment. About 30,000 new releases are reported each year. Between the beginning of the UST program and September 1997, approximately 341,000 UST releases have been confirmed. EPA estimates that about 60 percent or more of these releases have affected ground water. Consequently, leaking USTs pose a potentially widespread threat to our nation's ground water.

Releases of regulated substances into the environment are generally attributed to corrosion, faulty installation, and spills and overfills. Corrosion occurs when bare metal, soil, and moist conditions combine to produce an underground electric current that destroys hard metal. Over time, corrosion can create holes in the body of the tank and piping, increasing the likelihood of leaks into the soil. The speed and severity of corrosion varies depending on site-specific factors.

Improper installation is also a typical cause of UST failure. Proper installation is crucial to ensure the structural integrity of both the tank and its piping. Proper installation procedures include excavating the soil, siting where the tank system should be located, determining burial depth, assembling the tank system, backfilling around the tank system, and grading the surface soil (i.e., evening out surface where the soil was replaced). Installation problems generally result from careless installation practices that do not follow standard industry codes and procedures. For example, mishandling of the tank during installation can

RELEASES FROM USTS

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cause cracks in fiberglass-reinforced plastic tanks or damage the protective coating on steel tanks, leading to corrosion.

Finally, spills and overfills, usually caused by human error during product transfers, contribute to tank leakage. Spills often occur when the tanks are filled during routine product deliveries. Although these spills are small, repeated releases of any size can have substantial environmental impacts. Overfills normally release much larger

volumes than spills. Overfills occur when tanks are filled beyond their capacity and excess product is released. Installation of spill and overflow protection, in addition to following industry standards for correct filling practices, help to prevent such releases from occurring.

THE UNDERGROUND STORAGE TANK REGULATORY PROGRAM

Congress, when developing RCRA Subtitle I, chose to subject only about one-third of the total number of UST systems that were in use when the law was enacted to the UST program. The tanks that were specifically exempted from the scope of the regulations were selected by Congress because these particular types of USTs were regulated under federal, state, or local laws.

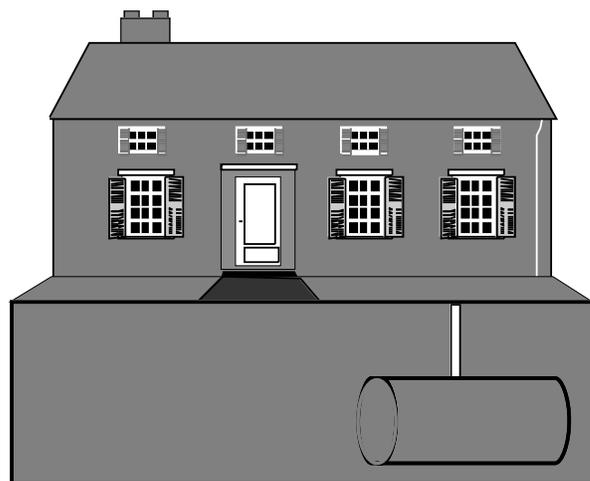
■ Program Scope

While tanks that have at least 10 percent of their combined volume underground and are used to store petroleum and hazardous substances are subject to the RCRA Subtitle I program, not all tanks meeting this definition of an UST are required to comply with the requirements. Congress specifically excluded certain tanks from the definition, including:

- Farm and residential tanks of 1,100 gallons or less capacity holding motor fuel used for noncommercial purposes
- Tanks storing heating oil used on the premises where it is stored
- Tanks on or above the floor of underground areas, such as basements or tunnels
- Septic tanks and systems for collecting wastewater and storm water
- Flow-through process tanks (i.e., tanks that are part of production processes and have a steady flow of materials through the tank during operation)
- Pipeline facilities
- Surface impoundments, pits, ponds, or lagoons
- Storm water or wastewater collection systems
- Liquid traps or associated gathering lines directly related to oil or gas production and gathering operations.

Upon examination of the UST universe, EPA determined that there were additional tanks that should not be subject to the federal regulatory program due to their size, content, location, or regulation under other programs. As a result, EPA excluded the following tanks:

- UST systems holding hazardous wastes listed or identified under RCRA Subtitle C, or a mixture of such wastes and regulated substances



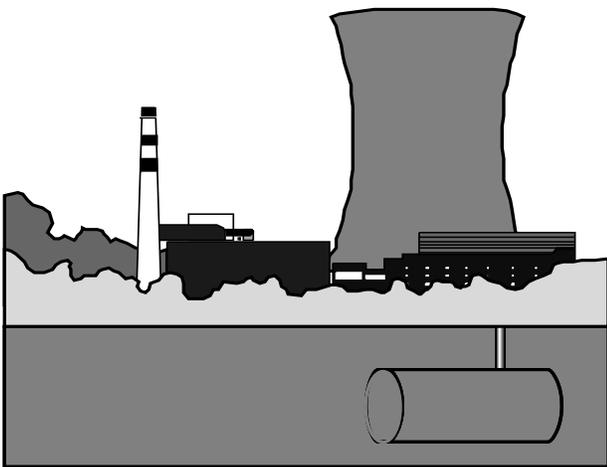
- Wastewater treatment tank systems that are part of a wastewater treatment facility regulated under CWA
- Equipment or machinery that contains regulated substances for operational purposes, such as hydraulic lift tanks and electrical equipment tanks
- UST systems with a capacity of 110 gallons or less
- UST systems that contain de minimis concentrations of regulated substances
- Emergency spill or overflow containment UST systems that are expeditiously emptied after use.
- UST systems that are part of emergency generator systems at nuclear power generation facilities
- Airport hydrant fuel distribution systems
- UST systems with field-constructed tanks.

UST systems that store fuel solely for use by emergency power generators are deferred from the release detection requirements only.

In order to fully protect human health and the environment, these deferred tanks are still subject to release response and corrective action regulations to ensure that any leaks from a deferred UST system will be addressed and cleaned up. Additionally, all deferred tanks are subject to an interim prohibition which generally requires that such tanks installed after May 8, 1985, comply with certain technical requirements that provide basic protection of human health and the environment.

EPA also identified tanks that did not warrant exclusion, but should not be subject to full regulation. As a result, EPA deferred certain tanks from the requirements for design and installation, operation, release detection, release reporting and investigation, closure, and financial responsibility. These deferred tanks include:

- Wastewater treatment tank systems
- UST systems containing radioactive material regulated under AEA



■ Notification

Because of the vast number of USTs already in existence when Congress enacted RCRA Subtitle I, EPA found that developing UST regulations and classifying the number of USTs in the United States was an intensive task. EPA's first action in responding to this mandate was to establish a notification system allowing tracking of existing USTs, as well as providing a mechanism to identify when a new UST was brought into operation. As a result, owners and operators of UST systems that were in the ground on or after May 8, 1986, were required to notify the state or local agency of the tank's existence, unless the tank was taken out of operation on or before January 1, 1974. Any owner and operator who brings an UST into use after May 8, 1986, must notify the designated state or local agency of the existence of the tank system within 30 days of bringing the tank into

use. In addition, any person who sells a tank intended to be used as an UST must inform the purchaser of the notification requirement.

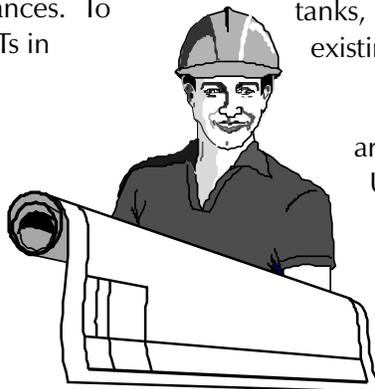
■ Technical Requirements

In response to the scope of the UST problem and Congress' mandate, EPA issued technical performance standards for all USTs and regulations to require petroleum UST owners and operators to have the financial means to pay for cleanups and to compensate third parties. These standards, codified in 40 CFR Part 280, encompass provisions for UST:

- Design, construction, and installation
- Operation
- Release detection
- Release reporting, investigation, and confirmation
- Corrective action
- Closure
- Financial responsibility.

New vs. Existing Underground Storage Tank Systems

At the time EPA's technical regulations for USTs came into effect, many tanks were already being used to store regulated substances. To accommodate the thousands of USTs in existence at the time the federal regulations were established, EPA built a certain amount of flexibility into the UST program to ensure that tanks already in use were covered by the new program, yet not immediately subjected to the new, potentially



NEW VS. EXISTING TANKS

New tanks are those that are installed, or that have commenced installation, after December 22, 1988. These tanks are expected to be in compliance with all of the technical standards upon installation. Existing tanks are those that were in service, or for which installation had commenced, on or before December 22, 1988. Existing tanks have until this date to meet the performance standards for new tanks, meet the upgrading requirements for existing tanks, or be taken out of service.

costly, design standards. To address this issue, EPA made a distinction in the UST regulations between new tanks and existing tanks. **New USTs** are those that were installed or that had commenced installation after December 22, 1988. These tanks are expected to be in compliance with all of the technical standards upon installation.

Existing USTs are those that were in service, or for which installation had commenced, on or before December 22, 1988. At the time the regulations went into effect, approximately two million tanks were considered existing. While EPA felt that these tanks could pose the same threat as new tanks, and thus should be subject to the same standards as new tanks, the Agency granted a period during which the existing tanks could come into compliance with the regulations. This phase-in or **upgrading** period expires December 22, 1998. At that time, existing tanks must either meet the performance standards for new tanks, meet the upgrading requirements for existing tanks, or be properly closed.

While the standards for existing USTs are often identical to those for new USTs, there are limited circumstances where the standards for new USTs would be impracticable for existing USTs to implement immediately. This chapter will focus primarily

on the standards for new USTs, contrasting them with the standards for existing USTs where appropriate.

Design, Construction, and Installation

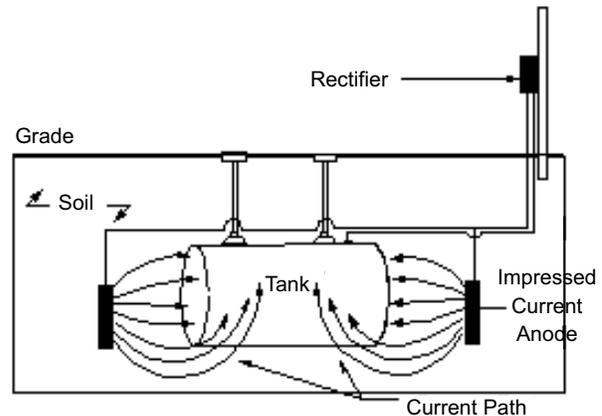
Proper installation is crucial to ensuring the structural integrity of both the tank and its piping. Therefore, owners and operators of tank systems must certify on their UST notification form that the tank system was installed in accordance with the manufacturer's instructions and in accordance with practices developed by nationally recognized associations, such as the Petroleum Equipment Institute (PEI).

Tanks are also required to be designed and constructed in such a way as to protect them from corrosion. This can be accomplished by constructing the tank of materials that do not corrode, such as fiberglass-reinforced plastic, or outfitting a steel tank with a thick layer of noncorrodible material. A third option, known as **cathodic protection**, uses sacrificial anodes or a direct current source to protect steel by halting the naturally occurring electrochemical process that causes corrosion (see Figure IV-1). Piping that routinely contains product, and that is in contact with soils, must meet similar corrosion protection standards.

Owners and operators of USTs must also ensure that any substance stored in the UST does not react in such a way that it threatens the integrity of the tank. For this reason, the tank and piping must be made of, or lined with, a material that is compatible with the substance stored in the tank.

In order to remain in service after December 22, 1998, existing tanks that are not constructed with noncorrodible material are required to install corrosion protection as part of the upgrading requirements. This may be in the form of cathodic protection, an interior lining of

Figure IV-1: CATHODIC PROTECTION



UST corrosion is caused by an electric current that is created when bare metal is placed in soil. Cathodic protection prevents such corrosion. The above impressed current system sends electric current from anodes, through the soil to the UST system to protect the tank by overcoming the corrosion-causing current normally flowing from the tank.

noncorrodible material, or a combination of the two. Corrosion protection in the form of cathodic protection is also required for piping.

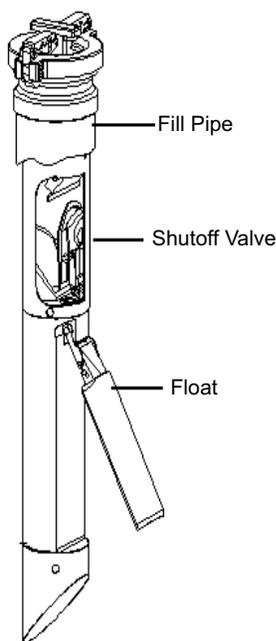
In addition to these design standards, tank systems are subject to general requirements to ensure proper operation and maintenance.

Operation

The general operating requirements provide owners and operators with a set of standards to ensure that routine daily operations are conducted safely. These requirements are geared primarily toward the prevention of spills, overfills, and corrosion.

Spill and Overfill Protection

Spill and overfill protection requirements include common-sense procedures, such as ensuring that there is enough room in the tank to receive a delivery of gasoline before the delivery is

Figure IV-2: OVERFILL PROTECTION

An UST owner and operator can meet overfill protection requirements by using an overfill protection device. Such devices either shut off delivery once the product has reached a certain level in the tank, or sound an alarm that notifies the delivery driver that the tank is almost full. For example, an automatic shut off device (or fill pipe device) has one or two valves that are operated by a float mechanism. When the product reaches a certain level in the tank (i.e., when the float mechanism reaches a certain level), the device will shut off the flow of product into the tank.

made, and watching the entire delivery to prevent spilling or overfilling. In addition, spills and overfills must be eliminated or minimized by installing certain equipment. For example, catchment basins can contain small amounts of product that are spilled when the delivery hose is disconnected from the fill pipe. Overfill protection devices either shut off delivery once the product has reached a certain level in the tank, or sound an alarm that notifies the delivery driver that the tank is almost full (see Figure IV-2). As with design and installation requirements,

standards for product transfer are based on standards developed by nationally recognized associations.

All tank systems are subject to the general operating standards for spill and overfill control. New tanks must have catchment basins and overfill protection devices when they are installed. Existing tanks must install spill and overfill protection devices by December 22, 1998, as part of their upgrading requirements. The only exception to these requirements is that USTs, either new or existing, which never receive product transfers of more than 25 gallons at a time, do not have to meet the spill and overfill design standards.

Corrosion Protection

Both new UST systems and existing UST systems that have been upgraded with corrosion protection must follow guidelines for the operation and maintenance of the corrosion protection equipment. The regulations require that corrosion protection systems be properly operated and maintained to ensure that no releases occur. In addition, UST systems with cathodic protection must be periodically inspected and tested to ensure that the equipment is operating properly. Finally, the owner and operator must keep records documenting compliance with these operation, maintenance, and inspection requirements.

Release Detection

EPA included release detection requirements in the UST regulations to detect releases from leaking tanks before they pose threats to or damage human health and the environment. All new USTs are required to have release detection (also referred to as leak detection) for tanks and piping when they are installed. Existing USTs were

required to meet release detection requirements for tanks and piping no later than December 1993.

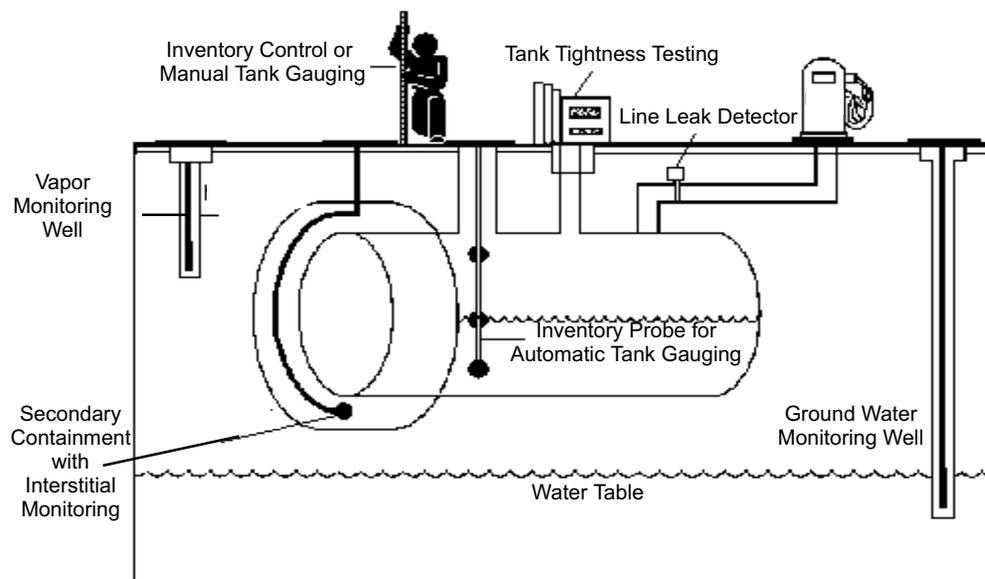
There is no single release detection system that is best for all sites, nor is there a particular type of release detection that is consistently the least expensive. Identifying the best leak detection choice for an UST depends on a number of factors, including cost (both initial installation cost and long-term operation and maintenance cost), facility configuration (such as the complexity of piping runs and tank systems), ground water depth, soil type, seasonal rainfall and temperature ranges, availability of experienced installers, and other variables best evaluated by professionals.

Based on these and other factors, petroleum UST owners and operators can choose any of these seven release detection methods (see Figure IV-3):

- Interstitial monitoring
- Automatic tank gauging systems
- Vapor monitoring
- Ground water monitoring
- Statistical inventory reconciliation (SIR)
- Manual tank gauging for small USTs
- Other methods meeting performance standards.

The federal UST program also includes different release detection requirements for hazardous substance tanks as well as for underground piping for all USTs. Lastly, the federal regulations contain recordkeeping provisions requiring owners and operators to document compliance with the release detection standards.

Figure IV-3: RELEASE DETECTION METHODS



UST owners and operators can provide release detection for their tanks using several different methods. These include secondary containment with interstitial monitoring, automatic tank gauging, vapor monitoring, ground water monitoring, and SIR (not pictured). In some cases, owners and operators can combine either inventory control or manual tank gauging with tank tightness testing. Owners and operators must also provide release detection for piping, including automatic line leak detectors for pressurized piping.

Interstitial monitoring involves the use of secondary containment, such as a barrier, outer wall, vault, or liner around the UST or piping to prevent leaking product from escaping into the environment. Alternatively, tanks can be equipped with inner bladders to provide secondary containment. If product escapes from the inner tank or piping, it will then be directed towards an interstitial monitor located between the walls.

Automatic tank gauging systems use a probe in the tank that is wired to a monitor to provide information on product level and temperature. These systems automatically calculate the changes in product volume that can indicate a leaking tank.

Vapor monitoring measures product fumes in the soil around the UST to check for leaks. This method requires installation of carefully placed monitoring wells. Owners and operators can perform vapor monitoring on a periodic basis, or continuously, using permanently installed equipment.

Ground water monitoring senses the presence of liquid product floating in ground water. This method requires installation of monitoring wells at strategic locations in the ground near the tank and along the piping runs. To discover if leaked product has reached ground water, owners and operators can periodically check these wells by hand, or monitor them continuously with permanently installed equipment. This method cannot be used at sites where ground water is more than 20 feet below the surface.

With **statistical inventory reconciliation**, owners and operators use sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data. These data are then analyzed to determine if any product has been released.

Owners and operators of USTs with a capacity of 1,000 gallons or less can use **manual tank gauging** as the sole method of release detection for the life of the tank. Manual tank gauging requires owners and operators to keep the tank undisturbed for at least 36 hours each week, during which time the contents of the tank are measured. At the end of each week, owners and operators analyze the test results to determine if the tank is leaking.

Any other release detection technology can be used if it meets a performance standard of detecting a leak of 0.2 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of no more than five percent.

These seven release detection methods are monthly monitoring methods, and eventually, all UST owners and operators will have to use at least one of them. It may, in some cases, require a significant investment of time and resources for owners and operators to get these release detection methods in place. In the interim, UST owners and operators can combine either inventory control or manual tank gauging with tank tightness testing. The length of time that owners and operators can use these temporary methods depends on whether their UST meets the standards for new or upgraded tanks, when the UST was upgraded to meet corrosion protection requirements and, in some cases, the size of the tanks.

- Inventory control with tank tightness testing — This method combines monthly inventory control with periodic tank tightness testing. **Inventory control** involves taking measurements of tank contents, recording the amount of product pumped each operating day and reconciling these data at least once a month. **Tank tightness testing** describes a variety of methods used to determine if a tank

is leaking; most of these methods involve monitoring changes in product level or volume in a tank over a period of several hours.

- Manual tank gauging with tank tightness testing — Owners and operators of tanks with a capacity of 2,000 gallons or less can temporarily use monthly manual tank gauging with periodic tank tightness testing.

Hazardous Substance USTs

Hazardous substance USTs must meet different release detection requirements. New USTs must employ secondary containment with interstitial monitoring. By enclosing such tanks with a second wall, leaks can be detected quickly and contained before harming the environment.

Existing USTs are not required to comply with these standards until December 22, 1998, as part of their upgrading requirements. Until that time, owners and operators of existing hazardous substance USTs can use any of the previously discussed release detection methods for petroleum USTs.

Piping

Underground piping for all USTs (both new and existing petroleum and hazardous substance tanks) that routinely contains a regulated substance is also subject to release detection standards. Pressurized piping requires automatic line leak detectors and an additional monitoring method, such as an annual line tightness test or certain previously mentioned monthly monitoring methods for tanks. Suction piping may or may not require release detection, depending on how such piping is designed. For example, suction piping that has enough slope to allow product to drain back into the tank does not require release detection. However, suction piping that is subject

to release detection requirements must use a periodic line tightness test or certain monthly monitoring methods for tanks.

Recordkeeping

The release detection recordkeeping requirements include maintaining results of any sampling, testing, or monitoring, as well as maintaining documentation of all calibration, maintenance, and repair of release detection equipment. These record retention provisions are applicable to new and existing petroleum and hazardous substance tanks and piping.

Release Reporting, Investigation, and Confirmation

UST release detection requirements are intended to prevent petroleum and hazardous substances from leaking into the environment. Unfortunately, many releases have already occurred and may occur in the future. As a result, the UST regulations stipulate procedures for investigating and confirming suspected releases from petroleum and hazardous substance USTs, and reporting such releases to the implementing agency. All UST owners and operators must be attentive to a variety of warning signals that indicate an UST may be leaking. These include evaluation of results of release detection monitoring and testing, observation of any unusual operating conditions at the pump (such as erratic or overly slow product flow), and evidence of product leakage into the environment (e.g., the presence of petroleum in nearby surface water or wells). Upon observing such warning signals, the owner and operator must immediately report the suspected release to the implementing agency. The owner and operator must then determine if the suspected release is an actual release by conducting tightness testing of the entire UST system to determine a possible source. The owner

and operator must also measure for the presence of contaminants in soil or ground water, and determine the source of the release if such contamination has been discovered.

If the results of tank tightness testing or the site inspection (or both) indicate that no release has occurred, then no further investigation is required. If, however, the results of these investigations indicate that a release has occurred, the owner and operator must respond by immediately stopping the release and repairing or replacing any damaged equipment. If an owner and operator chooses to repair rather than replace a damaged pipe or tank, EPA requires the repair person to follow standard industry codes, such as codes established by the American Petroleum Institute (API), for correct repair practices. In addition, the owner and operator must take steps to clean up the release through the UST corrective action program.

Corrective Action

Corrective action for UST systems is designed to ensure that releases of regulated substances do not threaten human health and the environment. While corrective action procedures are comprised of a series of steps, the exact action to be taken and the level of response required vary depending on the severity of the release and the nature of the containment.

Response to confirmed releases consists of short-term and long-term stages. The initial stage of the response consists of short-term actions to stop and contain the leak or spill and steps to ensure that the leak or spill poses no immediate hazard to human health and safety, such as removing explosive vapors and other fire hazards. The owner and operator must also remove as much product from the UST system as necessary to prevent any further release; begin to recover any free (released) product; and provide a report

to the implementing agency that includes a description of the initial actions taken, an assessment of the extent of contamination, and a plan on how they will clean up the release.

Based on data collected during the initial site characterization, the implementing agency will decide whether further action is warranted. Some leaks and spills will require additional long-term attention to correct the problem. In these cases, the implementing agency will request a corrective action plan from the owner and operator that describes how they will clean up contaminated soil and ground water. The implementing agency will then evaluate the plan to determine if it will adequately protect human health and the environment, taking into account such factors as the type of substance released, potential impacts on drinking water, and other site-specific concerns. Once the corrective action plan is approved, the owner and operator must implement the plan and report the results of the cleanup to the implementing agency.

One methodology that helps implementing agencies address UST sites requiring corrective action is **risk-based decision-making** (RBDM). EPA encourages states to incorporate RBDM into the implementation of their corrective action programs. RBDM is a process that uses risk and exposure assessment concepts to help UST implementing agencies establish enforcement priorities. Because of the vast number of leaking USTs and the limited financial and human resources available to implement corrective action at these sites, RBDM is an important tool in expediting assessments and cleanups at contaminated sites. It is also used to tailor the cleanup response to the level of risk posed by a particular site. For example, implementing agencies may use RBDM to categorize or classify sites, to aid in establishing cleanup goals, and to decide on the necessary level of oversight.

Closure

If an UST is taken out of service for any period of time, the owner and operator must close the UST system according to certain procedures in order to ensure adequate protection of human health and the environment. Closure can be done on either a temporary or permanent basis.

Temporary Closure

If the owner and operator plan to bring the tank system back into service at a later date, they may close the tank temporarily. **Temporary closure** requires the owner and operator to continue to operate and maintain the corrosion protection system and, if any product remains in the tank, to maintain the leak detection system. During temporary closure, the tank remains subject to release response and corrective action requirements. If the owner and operator take the UST out of service for longer than three months, they must leave the vent lines open and functioning, and cap and secure all other lines attached to the tank.

Permanent Closure

Tanks cannot be temporarily closed for a period longer than 12 months unless they meet the requirements for new or upgraded tanks. If the tank does not meet these requirements, or if the owner and operator decide to discontinue using the tank altogether, they must permanently close the UST system.

Permanent closure involves a number of steps designed to ensure that the tank will pose no threats to human health or the environment after it is closed. These steps include notifying the implementing



agency of the intent to close the tank, assessing the tank and surrounding area to determine if any releases have occurred, initiating corrective action to clean up any such releases, removing all liquids and accumulated sludges from the tank, and either removing the tank from the ground or filling it with an inert solid material, such as concrete or sand (if state and local regulations allow it).

Changes In Service

In some cases, an owner and operator may decide to use a formerly regulated UST system to store a nonregulated substance. This is considered a **change in service**. Before making this change, the owner and operator must notify the implementing agency, empty and clean the tank, conduct a site assessment to determine if a release has occurred, and initiate corrective action if appropriate.

For both tank closures and changes in service, the owner and operator must maintain results of the site assessment for at least three years, or mail the results to the implementing agency.

Financial Responsibility

When Congress amended RCRA Subtitle I in 1986, it recognized that UST corrective action could be very expensive, and as a result, some UST owners and operators might not be able to pay for such cleanups. Similarly, Congress discovered that releases from USTs had the potential both to inflict severe damage on neighboring property and threaten human health. In response to these concerns, Congress directed EPA to establish UST financial responsibility requirements to ensure that owners and operators would have the financial resources to pay for any necessary corrective action, as well as compensate third parties for bodily injury and property damage (known as third-party damages) resulting from leaking USTs.

The UST financial responsibility regulations apply only to petroleum UST owners and operators. State and federally owned and operated USTs are exempt from these requirements because it is assumed that such entities already have the financial resources to pay for corrective action and liability expenses.

The UST financial responsibility requirements require coverage in both per occurrence and annual aggregate amounts.

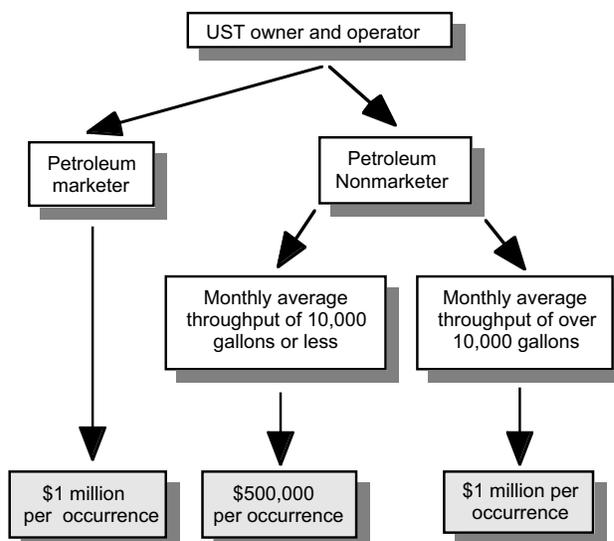
Per Occurrence Coverage

Per occurrence means the amount of money that must be available to pay for the costs from one leak. These requirements are based on whether a facility markets (i.e., sells) petroleum to the public and the volume of petroleum handled at a facility. All petroleum marketers, and facilities that handle an average of 10,000 gallons of petroleum per month, are required to demonstrate at least \$1 million in per occurrence coverage. Petroleum nonmarketers are required to demonstrate at least \$500,000 in per occurrence coverage (see Figure IV-4). For example, owners and operators of gas stations, which are considered marketers because they sell petroleum to the public, would need to demonstrate \$1 million in per occurrence coverage for their USTs. On the other hand, owners and operators of USTs used to fuel vehicles that are rented to the public, which are considered nonmarketers, would need to demonstrate \$500,000 in per occurrence coverage if their average monthly throughput was less than 10,000 gallons.

Annual Aggregate Coverage

Annual aggregate is the total amount of financial responsibility coverage required to pay for the costs of all leaks that might occur in one year. These requirements are based on the number of USTs owned and operated at all

**Figure IV-4:
PER OCCURRENCE COVERAGE**



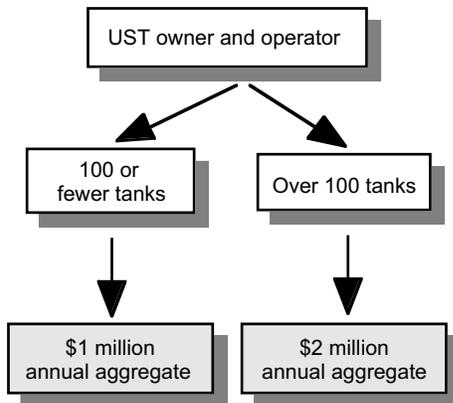
locations. Owners and operators of over 100 USTs are required to demonstrate at least \$2 million in annual aggregate coverage. Owners and operators of 100 or less tanks are required to demonstrate at least \$1 million in annual aggregate coverage (see Figure IV-5).

Mechanisms

Financial responsibility mechanisms are the different ways an UST owner and operator can show that funds are available to pay for corrective action and liability requirements. An owner and operator must demonstrate financial responsibility through one or more of the following mechanisms:

- State assurance funds — Most states have established programs that can help pay for cleanup and third-party liability costs resulting from leaking USTs. Generally, the **state assurance funds** are funded by gasoline taxes, tank fees, or a combination of both. The terms and conditions of the state assurance funds vary greatly, and participation can either

**Figure IV-5:
ANNUAL AGGREGATE COVERAGE**



be mandatory or voluntary. Participating UST owners and operators, in good standing with their state assurance fund, can use that fund to demonstrate financial responsibility.

- Financial test of self-insurance — Some companies are of such size and financial strength that they have the assets to absorb the costs incurred by UST corrective action and liability. As a result, such owners and operators can demonstrate their financial strength by using the **financial test** of self-insurance to satisfy the UST financial responsibility requirements.
- Corporate guarantee — While not all companies will be able to meet the financial test requirements, they may be owned by a company (either corporate parent or grandparent), may have a sibling company, or may have a “substantial business relationship” with another company that has the financial standing and ability to meet the financial test requirements. In these cases, an UST owner and operator may arrange to have their corporate parent, corporate grandparent, sibling corporation, or firm with a substantial business relationship meet the UST financial responsibility requirements on their behalf and provide them with a **corporate guarantee**.
- Insurance or risk retention group coverage — An UST owner and operator can take out an **insurance** policy to cover the corrective action and liability coverage requirements. Owner and operators can also use **risk retention groups**, which are entities formed by businesses or individuals with similar risks to provide insurance coverage for those risks.
- Surety bond — A **surety bond** is a guarantee by a surety company that it will meet the obligations of the UST owner and operator in the event of a failure to satisfy corrective action or liability requirements. If the owner and operator fails to pay the costs specified in a bond, the surety company is liable for the costs, but the owner and operator must then repay the surety company. The owner and operator must also establish a standby trust fund into which any payments made by the surety company will be deposited. EPA or the states then use this trust fund to cover the respective costs.
- Letter of credit — A **letter of credit**, issued by a financial institution (such as a bank), is a contract between the UST owner and operator, the issuer, and the implementing agency. Under the terms of this agreement, if the UST owner and operator fails to pay for corrective action or liability, the implementing agency will direct the issuer to deposit such payments into a standby trust fund.
- Trust fund — Under a **trust fund**, aggregate funds for UST corrective action and liability are held and administered by an impartial third party (usually a bank). By placing such money in an independent fund, the funds will not be commingled with the owner’s and operator’s other assets, and will always be available on the event that a release occurs, or a claim is made.

These financial responsibility mechanisms were developed to meet the needs of the private sector. Many local government UST owners and operators had difficulty demonstrating compliance with these mechanisms because of slight differences in their financial management and accounting practices. As a result, EPA promulgated four additional options that local governments could choose to demonstrate UST financial responsibility. These mechanisms are:

- Bond rating test
- Financial test
- Guarantee
- Dedicated fund.

While the bond rating and financial tests are modeled after the UST financial test of self-insurance, the guarantee is similar to the corporate guarantee, and the dedicated fund is similar to the trust fund, these mechanisms were all tailored to meet the special needs of local governments.

LENDER LIABILITY

Many UST owners and operators must secure loans from financial and other institutions to comply with environmental regulations, such as UST upgrading and maintenance requirements. These owners and operators often use the property on which the UST is located as collateral in order to secure the loan. Financial institutions have historically been reluctant to extend loans to UST owners and operators for fear of later incurring UST cleanup liability. For example, if a bank held property as collateral for a service station that later became bankrupt, the lender would take

possession of the property, becoming the owner of the property and the tanks on it. Financial institutions feared that they would then be subject to the UST regulations, including financial responsibility for corrective action and third-party liability. Until recently, this potential for lending institutions to be held liable for releases from USTs, known as lender liability, greatly hampered the ability of UST owners and operators to secure the capital necessary to make tank improvements, upgrade the UST, or comply with other requirements.

EPA published the lender liability regulations in 1995. The rule provides lenders with an exemption from all federal UST regulatory requirements provided that the lender, or secured creditor, does not participate in the management or operation of the UST system. This means that the lender is exempt from corrective action requirements and liability for cleanup costs of contaminated property, both prior to and after foreclosure, as long as the lender does not engage in petroleum production, refining, or marketing, does not manage or operate the UST, and does not store petroleum in the UST after foreclosure.

STATE UNDERGROUND STORAGE TANK PROGRAMS

States play a central role in the administration of the UST program. Because of the size and diversity of the UST regulated community, states and local governments are in the best position to oversee the regulation of USTs. Congress intended for states to take over the day-to-day administration of the UST program from the federal government; therefore, RCRA Subtitle I allows EPA to approve state UST programs to operate in lieu of the federal



UST program provided they are at least as stringent as the federal program and ensure adequate enforcement.

In order to be approved, a state program must meet three requirements. First, the state program must set standards for eight performance criteria that are no less stringent than federal standards. These include the standards for:

- New UST system design
- General operating requirements
- Release detection
- Upgrading
- Release reporting
- Corrective action
- Financial responsibility
- Closure.

Second, the program must contain provisions that ensure adequate enforcement of the UST regulations. This means that the state must have adequate legal authority to implement and enforce the regulations, including the authority to inspect records and sites, require monitoring and testing, and assess penalties. In some cases, states will have to enact additional laws in order to have adequate authority. The state program must also include opportunities for public participation in the state enforcement process.

Finally, the state program must regulate at least the same universe of USTs covered by the federal program, although many states may choose to implement programs that are broader in scope than the federal program. For example, a state may regulate all heating oil tanks, even though the federal UST program excludes tanks used for storing heating oil for consumptive use on the premises where stored. In such cases, EPA does

not review or approve the portion of the program that is broader in scope than the federal program. EPA can, however, approve requirements that are more stringent than the federal program. For example, a state may receive approval from EPA to implement release detection requirements that are more stringent than those contained in the federal regulations.

Because state programs operate in lieu of the federal program, owners and operators in states that have an approved UST program do not have to comply with two sets of statutes and regulations. Once their programs are approved, states have the lead role in UST program enforcement; therefore, owners and operators need only comply with their state regulations to be in full compliance with all requirements. For states without approved programs, EPA works in conjunction with state officials to enforce the federal UST regulations. These states may have MOAs with their EPA Regional Office that allow them to implement specific parts of the UST regulations on behalf of EPA. Such agreements outline the nature of the state's responsibilities and oversight powers, and the level of coordination between the state and the EPA in implementing the program.

INSPECTIONS AND ENFORCEMENT

RCRA Subtitle I provides authority for federal and state personnel to request pertinent information from tank owners and operators; inspect and sample tanks; monitor and test tanks and surrounding soils, air, surface water, and ground water; respond to violations of tank standards through civil or administrative actions; and seek injunctive relief when human health or the environment are endangered.

EPA may issue compliance orders for any violation of the Statute or regulations. A violator who fails to comply with the order may be subject

HOW DO STATE UST PROGRAMS OPERATE?

Because state programs operate in lieu of the federal program, owners and operators in states that have an approved UST program do not have to comply with two sets of statutes and regulations. Once their programs are approved, states have the lead role in UST program enforcement; therefore, owners and operators need only comply with their state regulations to be in full compliance with all requirements.

to a civil penalty of up to \$27,500 per tank per day of noncompliance. In addition, any owner and operator who knowingly fails to notify or submits false information may be subject to civil penalties of up to \$11,000 for each tank for which notification is not given or false information is submitted. Furthermore, any owner and operator who fails to comply with any regulatory requirement under Subtitle I, may be subject to civil penalties of up to \$11,000 per tank, for each day of violation. Criminal penalties are not authorized under Subtitle I.

At all levels of government, regulatory agencies are granted some discretion in determining when to impose penalties. In the UST program, inspectors often issue a notice of violation or a warning letter to first-time violators when a facility is inspected, provided that the violations are not egregious. These informal enforcement actions are less resource-intensive for the states and are usually effective in promoting compliance. States and EPA generally reserve their strongest enforcement tools for use on facilities whose owners and operators have not been responsive to informal enforcement actions, facilities whose violations pose significant threats to human health and the environment, or facilities who have a history of noncompliance. Federal enforcement authorities include the use of field citations and administrative or judicial (or both) enforcement actions.

UST inspectors issue field citations at the time they identify violations. Field citations are not issued for serious violations. They are issued in cases where the violation is a first-time violation and is clear-cut, easily verifiable, and easily correctable. A field citation couples a fine with a requirement to correct the violation within 30 days. If a facility does not address the violation within 30 days, however, follow-up enforcement actions can assess additional penalties.

Apart from inspections, outreach and education are among of the most commonly used ways to familiarize UST owners and operators with the UST regulations and promote compliance. EPA and states produce and distribute a wide variety of informational materials, including booklets, leaflets, videos, and slide shows, designed to assist owners and operators in complying with the UST requirements. EPA and states also conduct seminars and workshops and use inspections as opportunities to explain the requirements and offer assistance. In addition, EPA works closely with trade associations representing tank owners and operators to provide compliance assistance information to their members.

LEAKING UNDERGROUND STORAGE TANK TRUST FUND

As part of SARA, Congress also created the **Leaking Underground Storage Tank Trust Fund**. The LUST Trust Fund has two purposes. First, it provides money for overseeing corrective action taken by a responsible party, usually a contractor hired by an owner and operator of the leaking UST. Second, the LUST Trust Fund provides money for cleanups at UST sites where the owner and operator is unknown, unwilling or unable to respond, or which require emergency action.

LEAKING UNDERGROUND STORAGE TANK TRUST FUND

The LUST Trust Fund provides money to states to oversee corrective action by a responsible party and to clean up sites where the owner and operator is unknown, unwilling, or unable to respond, or which require emergency action.

The LUST Trust Fund is financed through an excise tax on gasoline, diesel, and aviation fuels. As of March 1997, about \$1.8 billion had been collected, \$655 million of which has been given to EPA. About \$560 million has been dispersed to state programs for state officials to use for administration, oversight, and cleanup work. The remaining LUST Trust Fund money has been used by EPA for administrative activities: negotiating and overseeing cooperative agreements; implementing programs on Native American lands; and supporting EPA Regional and state offices.

To receive money from the LUST Trust Fund, a state must enter into a **cooperative agreement** with the federal government to spend the money for its intended purpose. Every state has a cooperative agreement with EPA. LUST Trust Fund money is divided among EPA Regional Offices based on a formula that uses state data. In fiscal year 1995, each state received a base allocation plus additional money depending on the following: the number of confirmed releases in the state; the number of notified petroleum tanks; the number of residents relying on ground water for drinking water; and the number of cleanups initiated and completed as a percentage of total confirmed releases.

States use LUST Trust Fund money to oversee corrective action by a responsible party and to clean up sites where no responsible party can be found. Less than five percent of all cases have been without a responsible party. To date, states have used about one-third of their LUST Trust

Fund money for administration, one-third for oversight and state-led enforcement, and one-third for cleanups.

SUMMARY

Across the United States, a wide range of persons, from large and small businesses to private entities, store regulated substances (petroleum and CERCLA hazardous substances) in USTs. An UST is defined as a tank and any underground piping connected to that tank that has at least 10 percent of its combined volume underground.

Not all tanks storing regulated substances are subject to the UST regulations, as some tanks are specifically exempted from the regulations due to their regulation under other laws.

In an effort to protect human health and the environment from releases from regulated USTs, EPA promulgated technical performance standards designed to ensure safe design, operation, maintenance, and closure. These standards, codified in 40 CFR Part 280, encompass provisions for UST:

- Design, construction, and installation
- Operation
- Release detection
- Release reporting, investigation, and confirmation
- Corrective action
- Closure
- Financial responsibility.

When the UST regulatory program came into existence, there were over two million tanks already in the ground. To accommodate these USTs, EPA built flexibility into the regulatory program to allow such tanks to upgrade during a phase-in period. As of December 22, 1998, such

existing tanks must either meet the performance standards for new tanks, meet the upgrading requirements for existing tanks, or be taken out of service.

The UST technical requirements may be expensive to comply with. As a result, many owners and operators secure loans from private lending institutions. However, if owners and operators default on such loans, banks may foreclose on property containing such USTs. By default, the bank may become responsible and liable for compliance with the federal UST requirements, including the cleanup of all releases. In order to shield lending institutions from such requirements, and remove the disincentive for issuing such loans in the first place, EPA promulgated a lender liability provision to exempt lending institutions from the UST requirements provided they do not manage or operate the UST.

The UST program also includes state program approval provisions that are designed to help facilitate the delegation of UST program implementation to the states. This provides states the authority to ensure proper compliance with the federal standards, and allows states with approved programs to have primary enforcement responsibility. In order for a state to receive approval, its program must be no less stringent than the federal program, cover the same universe of tanks covered by the federal program, and provide for adequate enforcement of the state UST program. The UST program also includes provisions regarding inspections and enforcement.

Finally, the UST program includes a LUST Trust Fund. Under the LUST Trust Fund, EPA disperses money to states that have cooperative agreements with the Agency to provide money for overseeing corrective action taken by a responsible party and to provide money for cleanups at UST sites where the owner and operator is unknown, unwilling or unable to respond, or which require emergency action.

