

UPGRADING UNDERGROUND STORAGE TANKS CORROSION PROTECTION & SPILL AND OVERFILL PREVENTION

In 1988, federal regulations were adopted requiring all owners and operators of regulated underground storage tanks (USTs) to either upgrade their existing tanks and piping to meet required technical standards by December 1998 or close the substandard system. New regulated USTs must meet technical standards at the time of tank installation. In 1991, the Pennsylvania Department of Environmental Resources (now the Department of Environmental Protection (DEP)) adopted the same schedule and requirements for all state regulated USTs.

Upgrading USTs to meet technical standards requires corrosion protection on the tank and the piping, and the installation of spill and overfill prevention devices.

Although the deadline for upgrading most regulated existing USTs is December 1998, it is important for tank owners and operators to make the necessary improvements as soon as possible. Implementing upgrade requirements early in combination with other tank construction activities provides the following benefits: 1) cuts down on costs by preventing repeated tank excavations; 2) limits liability by reducing the chance of product release from substandard USTs; 3) reduces the potential for having large cleanup costs from a product release (the average cleanup cost is in excess of \$100,000 and may be much higher if groundwater is contaminated); and 4) protects public health and the environment.

DEP's Storage Tank Program is administered by the Bureau of Watershed Conservation, Division of Storage Tanks, P.O. Box 8762, Harrisburg, PA 17105-8762, 800-42-TANKS (in Pennsylvania only), 717-772-5599 or through the PA AT&T Relay Service at 800-654-5984 (telecommunication devices for the deaf).

What is corrosion protection?

Unprotected steel USTs are most commonly damaged by corrosion. When corrosion occurs, a steel UST system and its underground surroundings act like a battery. Part of the UST can become negatively charged and another part positively charged. This reaction causes the steel tank to corrode, thus forming holes that result in leaks.

Steel tanks and piping can be protected by applying a corrosion-resistant coating and by using cathodic protection. Cathodic protection reverses the electric current that causes corrosion. There are two forms of cathodic protection: sacrificial anodes (galvanic) and impressed current.

Sacrificial anodes are pieces of metal that can be attached to the UST. The anodes are more electrically active than the steel UST. Therefore, the electric currents will exit from and corrode the anodes rather than the UST. The anodes are said to be sacrificed, thus the name. This type of corrosion protection is

useful for protecting small, damaged areas of coated steel tanks and piping.

An impressed current protection system introduces an electric current into the ground through a series of anodes that are not attached to the UST. The impressed current stops the corrosion process because, like the sacrificial anodes, the electric current is greater than the corrosive current. With proper design impressed current protection can be used on any size system.

All cathodic protection systems used must be designed by a corrosion expert, and installed, maintained and operated properly.

Other ways of preventing leaks from corrosion are to install tanks and piping made of noncorrodible material such as fiberglass, or by installing tanks (but not piping) that are protected from corrosion by a thick bonded layer of noncorrodible material, such as fiberglass-reinforced plastic. Cathodic protection is not needed for these corrosion protection methods.

What is spill and overflow prevention?

Many releases are caused by spills and overfills. Spills most often occur at the fill pipe opening when the delivery truck's hose is disconnected. Repeated releases of this nature can create environmental problems.

Overfills occur less frequently but usually result in larger-volume releases. When a tank is overfilled, large volumes of product can be released through loose fittings on the top of the tank, through the vent pipe or when the delivery hose is disconnected.

To prevent spills and overfills, owners and operators must make sure that the tank's remaining capacity is greater than the volume of product to be delivered. All UST facilities must be equipped with devices that can prevent or severely limit spills and overfills.

Spill prevention devices, such as catchment basins and dry disconnect couplings, are readily available. Overfill prevention devices automatically shut off or restrict flow, or trigger an alarm when the tank is nearly full.

IMPORTANT NOTE about Stage II vapor recovery systems:

In Pennsylvania, most gasoline dispensing facility owners in moderate and above ozone nonattainment areas are required by regulations to install gasoline vapor recovery systems, known as Stage II.

To prevent repeated tank excavations, DEP strongly recommends that installing Stage II devices and meeting upgrading requirements be done at the same time. Preventing repeated excavations saves both time and money. (See the storage tank program's fact sheet #8 for information on Stage II requirements, or call DEP's Bureau of Air Quality at 717-787-4310.)

This fact sheet and related environmental information are available electronically via Internet.

Access the DEP website at <http://www.dep.state.pa.us> (choose Information by Subject/ choose Water Management/Watershed Conservation/Storage Tanks).

CORROSION PROTECTION	
NEW TANKS	<ul style="list-style-type: none"> ● Cathodically Protected Steel (sacrificial anode or impressed current) ● Fiberglass ● Steel Tank clad with Fiberglass ● Steel with plastic jacket
EXISTING TANKS	<ul style="list-style-type: none"> ● Same Options as for New Tanks ● Impressed current protection may be added to sound steel tanks ● Interior Lining ● Interior Lining and Cathodic Protection
NEW PIPING	<ul style="list-style-type: none"> ● Cathodically Protected Steel ● Fiberglass ● Approved plastic
EXISTING PIPING	<ul style="list-style-type: none"> ● Same Options as for New Piping (impressed current protection may be added to sound steel piping)
SPILL/OVERFILL PREVENTION	
ALL TANKS	<ul style="list-style-type: none"> ● Catchment Basin and <ul style="list-style-type: none"> ● Automatic Shutoff Device; or ● Overfill Alarm; or ● Ball Float Valve or ● Fill tank in less than 25 gallon increments.