



# Protecting Underground Storage Tanks Against Corrosion

## A guide for owners and operators of USTs

This is module f of the PST Super Guide, a comprehensive guide to issues relating to petroleum storage tanks (PSTs). This super guide provides an overview to laws and regulations for PSTs and it can be used as an aid in minimizing potential risks. The guide does not replace those laws and regulations, which take precedence over any information in this publication.

Module f explains how to protect your underground storage tanks (USTs) against corrosion.

- You, the owner or operator of a PST, are responsible for ensuring compliance with all applicable laws and regulations.
- If your UST system is located in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, or Williamson County, additional requirements related to protecting the Edwards or the Trinity Aquifer may apply (Title 30, Texas Administrative Code [30 TAC], Chapters 213 and 214).
- In addition to the laws and TCEQ rules, local governments, and other state and federal agencies may have rules that apply.

## What is corrosion protection and what is its purpose?

Corrosion protection is a method of slowing or preventing metal components of a UST system from rusting or otherwise corroding or oxidizing. Its purpose is to ensure the structural integrity of the UST system so releases of regulated substances do not occur. All underground metal components of a UST system that contain, store, or convey regulated substances are required to be properly protected from corrosion, regardless of age, date of installation, or operational status. This includes, but is not limited to, tanks, piping, and flexible connectors. Other underground metal components associated with a UST system that also must be protected from corrosion include, but are not limited to, fill pipes, vent lines, submersible pump housings, spill containers, and riser pipes.

## What are my options?

Since Dec. 22, 1988, all new USTs are required to meet comprehensive corrosion protection standards.

Acceptable methods of corrosion protection include:

1. **Noncorrodible material.** Use of a material that will not corrode when exposed to soil or water, such as fiberglass for tanks and piping, or both.
2. **Electrical isolation.** Involves the protection of below ground metal components by putting them in an open area such as a sump, manway, vault, or pit and keeping them free from contact with water and soil.
3. **Secondary containment.** A manufacturing method of installing a wall or jacket around metal tanks or piping that meets specific standards for corrosion protection and protects the primary wall of the steel tank from the corrosive elements of soil and groundwater. An example might be jacketed steel tanks.
4. **Cathodic Protection.** Discussed below, is an option for protecting a UST system from corrosion.
5. **Dielectric Material.** A suitable dielectric coating or wrapping used to protect underground components from corrosion. If using this method, additional cathodic protection is required for components that routinely contain regulated substances.

## What is cathodic protection?

There are two types of cathodic protection systems: sacrificial and impressed current.

- **Galvanic System.** A sacrificial anode is connected to a metal component in a UST system. The anode, usually made of zinc or magnesium, is wired to the metal component and the anode corrodes instead of the tank or piping. This method is usually used on smaller structures, such as flexible connectors or other metallic piping components.
- **Impressed current.** Anodes connected to the system through a rectifier introduce an electrical current that will inhibit the corrosion of metal components. The anode is wired to the tank in the same manner as in the sacrificial system, but the metal component has such a large surface area that it requires greater protection. A rectifier pushes a low-voltage current through the impressed current cathodic system. The rectifier is usually located on the wall of the facility and has a gauge capable of reading the amperage output of the system.

Federal regulations require that the cathodic protection system be designed by a corrosion specialist. In Texas, a corrosion specialist must be a licensed professional engineer, or designated as a corrosion specialist by a nationally recognized trade group, such as the National Association of Corrosion Engineers.

## Testing frequency

A corrosion specialist or corrosion technician must test all cathodic-protection systems:

- at installation;
- three to six months after installation; and
- every three years thereafter.

You must also conduct an operational inspection for impressed current systems every 60 days. Record the results of your operational inspections to demonstrate that the rectifier is working properly (retain documentation for at least five years). Wildly varied rectifier readings may indicate a problem, and you should contact your corrosion specialist for specific instructions.

## What records do I need to keep?

Generally, you need to keep records to document that you are operating your UST system in compliance with applicable rules, including all:

- Installation documentation relating to corrosion protection, including information from the manufacturer of the tank and piping and about the cathodic protection system. Keep installation records for the life of the UST system.
- Rectifier readings and test records. A sample blank log, titled 60-Day Record of Impressed Current Cathodic Protection, is provided at the end of module f. Keep all test records and log readings for at least five years.

## Where do I find more information?

The complete requirements for corrosion protection are in 30 TAC 334.49, available at [texreg.sos.state.tx.us/public/readtac\\$ext.TacPage?sl=R&app=9&p\\_dir=&p\\_rloc=&p\\_tloc=&p\\_ploc=&pg=1&p\\_tac=&ti=30&pt=1&ch=334&rl=49](http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=334&rl=49).

Requirements for tanks in the Edwards Aquifer are in 30 TAC 213 available at [texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac\\_view=4&ti=30&pt=1&ch=213](http://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=213).

Requirements for tanks over other aquifers are in 30 TAC 214 available at [texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac\\_view=4&ti=30&pt=1&ch=214&rl=Y](http://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=214&rl=Y).

The National Association of Corrosion Engineers has a list of corrosion specialists and corrosion technicians at [www.nace.org](http://www.nace.org). You can search for corrosion specialists in your area by clicking on the link at the right side of the page titled “Find a Certified Professional.”

For confidential environmental compliance assistance for small businesses and local governments, contact Small Business and Local Government Assistance via the hot line at 800-447-2827 or online at [www.TexasEnviroHelp.org](http://www.TexasEnviroHelp.org).



## 60-Day Record of Impressed Current Cathodic Protection

If you have questions on how to complete this form or about the Petroleum Storage Tank (PST) program, please contact Small Business and Local Government Assistance at its hot line, 800-447-2827, or online at <[www.sblga.info](http://www.sblga.info)>.

### Facility Information

<b>Facility Name:</b>	<b>Facility ID No.:</b>
<b>Street Address:</b>	<b>City, State, Zip:</b>

### Instructions

- This form may be used to document operational checks of the cathodic protection system rectifier at least once every 60 days.
- If your rectifier is so equipped, you should also record the output voltage and current, and the number of hours indicated on the meter.
- Any significant variance should be reported to your corrosion professional so that any necessary repairs or adjustments can be made.
- A corrosion specialist or corrosion technician should test your cathodic protection every three years.
- Keep this form on file for at least five years.

### Impressed Current Rectifier Data

Important System Information	Your Data
<b>Rectifier Manufacturer:</b>	
<b>Rated DC Output</b> ( <i>record volts <b>and</b> amps</i> ):	
<b>Rectifier Model:</b>	
<b>Rectifier Serial Number:</b>	
<b>What is the “as designed” or most recent recommended rectifier output?</b> ( <i>record volts <b>and</b> amps</i> ):	

**Log of Rectifier Operation**

<b>Date Inspected</b>	<b>Rectifier Turned On?</b>	<b>Tap Setting (Course)</b>	<b>Tap Setting (Fine)</b>	<b>DC Output (Volts)</b>	<b>DC Output (Amps)</b>	<b>Hour Meter</b>	<b>Inspector Initials</b>	<b>Comments</b>