

CORROSION PROTECTION REQUIREMENTS For Underground Storage Tank Systems

Failure of underground steel storage tanks and lines is due to one primary phenomenon...corrosion. Most steel tank systems installed during the fifties, sixties, and seventies were installed without adequate corrosion protection and today threaten our groundwater resources with contamination.

A. DESIGN OF CORROSION PROTECTION

All field installed cathodic protection systems must be designed by a "corrosion expert" (see definitions).

B. OPERATION AND MAINTENANCE OF CORROSION PROTECTION

1. All corrosion protection systems must be operated and maintained to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.
2. All UST systems (see definitions) equipped with cathodic protection systems must be inspected for proper operation by a qualified "cathodic protection tester" (see definitions) in accordance with the following requirements:
 - a. All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter.
 - b. The criteria that are used to determine that cathodic protection is adequate must be in accordance with the code of practice developed by the National Association of Corrosion Engineers Standard RP-02-85.
3. UST protection systems with impressed current cathodic protection systems (defined in C.(1)b of this publication) must also be inspected every 60 days to ensure that equipment is running properly.
4. For UST systems using cathodic protection, records of the operation of the cathodic protection must be maintained. Records must provide the following:
 - a. Results of the last three inspections in (3) above.
 - b. Results of the last two inspections in (2) above.

C. CORROSION PROTECTION REQUIREMENTS FOR NEW UNDERGROUND TANKS AND PIPING:

1. New underground storage tanks must be protected by one of the following three choices:
 - a. Steel tanks can be coated with a corrosion resistant coating and "cathodically" protected. Cathodic protection reverses the electric current that causes corrosion and comes in two forms:
 - (1) "Sacrificial anodes" can be attached to the UST. Sacrificial anodes are pieces of metal more electrically active than the steel UST. Thus, the UST is the "cathode" and is protected from corrosion while the attached "anode" is sacrificed.

- (2) An “impressed current” protection system introduces an electric current into the ground through a series of anodes that are not attached to the UST. Because the electric current flowing from these anodes to the tank system is greater than the corrosive current attempting to flow from it, the UST is protected from corrosion.
- b. Tanks can be made totally of this noncorrodible material, such as fiberglass-reinforced plastic.
 - c. Steel tanks can be protected using a method in which a thick layer of noncorrodible material is bonded to the tank.
2. New piping must be protected by one of the following two choices:
- a. Piping can be coated with a corrosion-resistant coating and “cathodically” protected.
 - b. Piping can be made totally of a noncorrodible material, such as fiberglass-reinforced plastic.

D. CORROSION PROTECTION REQUIREMENTS FOR EXISTING UNDERGROUND TANKS AND PIPING:

Underground storage tanks that were installed before December 1988 must meet one of the following four corrosion protection requirements by December 1998:

1. Your first choice is to meet the corrosion protection requirements for new tanks and piping.
2. The interior of a tank can be lined according to industry codes. Tanks using only an interior lining for corrosion protection must pass an inspection in 10 years and reinspection every five years after that to ensure that the lining and tank are structurally sound.
3. Tanks using only cathodic protection must meet the general requirements for cathodic protection and satisfy one of the methods below to make sure that the tank is structurally sound:
 - a. If the tank is less than 10 years old, you can use one of the following monthly leak detection monitoring methods: Automatic tank gauging , monitoring for vapors in the soil, interstitial monitoring, monitoring for liquids on the groundwater, or other approved methods.
 - b. If the tank is less than 10 years old, you can have two tank tightness tests conducted. The first test must take place before you install cathodic protection and the second test must take place between three to six months later.
 - c. If the tank is 10 years old or more, it must be internally inspected and assessed to make sure that the tank is structurally sound and free of corrosion holes before a cathodic protection system is installed.

- d. You can combine tank interior lining with cathodic protection. If you use this combined method, you are not required to have the interior lining periodically inspected.

Unless the existing piping is made of noncorrodible material, it must meet the requirements for cathodic protection of new metal piping, except that the existing does not need to be coated with a corrosion resistant coating.

E. DEFINITIONS:

“Corrosion expert” means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control of buried or submerged metal piping systems and metal tanks. Such a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

“Underground storage tank” or “UST” means 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 the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground.

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

WHAT DO YOU HAVE TO DO?

CORROSION PROTECTION	
NEW TANKS 3 Choices	*Coated and cathodically Protected Steel *Fiberglass *Steel Tank clad with Fiberglass
EXISTING TANKS 4 Choices	*Same Options as for New Tanks *Add Cathodic Protection System *Interior Lining *Interior Lining and Cathodic Protection
NEW PIPING 2 Choices	*Coated and Cathodically Protected Steel *Fiberglass
EXISTING PIPING 2 Choices	*Same Options as for New Piping *Cathodically Protected Steel

WHEN DO YOU HAVE TO ACT?

TYPE OF TANK AND PIPING	CORROSION PROTECTION
New Tanks and Piping	At installation
Tanks installed prior to December 22, 1998	December 1998
Existing Piping (type):	
Pressurized	December 1998
Suction	December 1998