UST RELEASE

Serving Underground Storage Tank Owners and Operators in Utah

INSIDE:

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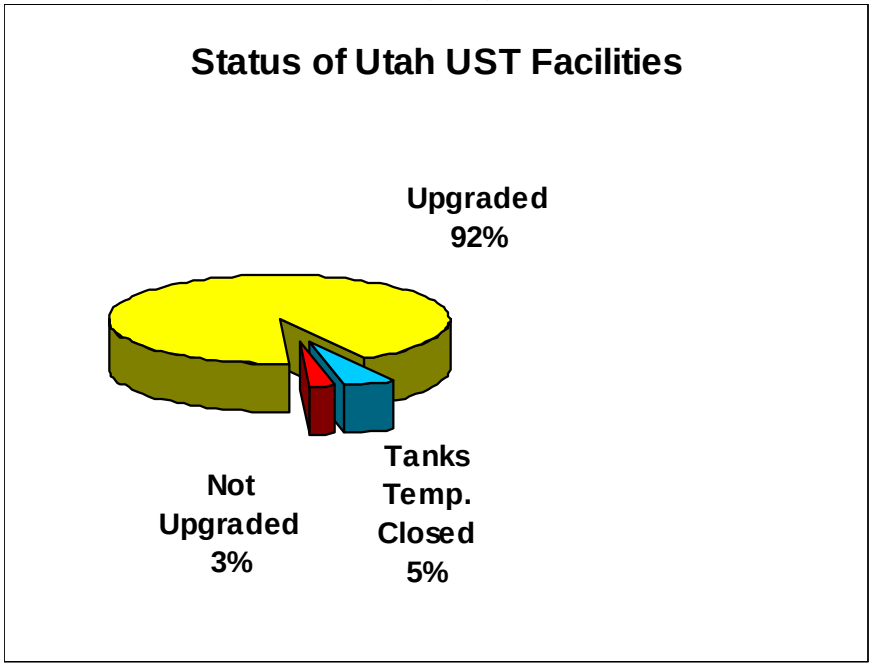
Who's In Compliance?

We applaud the efforts of responsible UST owners and operators who brought their systems into compliance with the federal upgrade deadline. As illustrated by the pie chart most of the facilities in Utah are in compliance with the upgrade requirements. For those facilities which are not in compliance, state inspectors will be coming to your facilities to verify the status of your USTs.

Tanks which are temporarily closed can remain so for up to 12 months, or until December 22, 1999, whichever comes first. At the end of that period there are two options for the tanks: either meet the upgrade requirements or be permanently closed.

Tanks which are not temporarily closed or upgraded are subject to fines and penalties of up to $10,000 a day.

If you have any questions regarding the status of your USTs contact the DERR at (801)-536-4100.



Cathodic Protection:
What it is and how it works

Corrosion is the enemy of buried steel tanks. Corrosion is an electrochemical process which involves both the transfer of electrons and a change in physical properties. For corrosion to occur, four components must always be present: an electrolyte, an electrical pathway, an anode and a cathode.

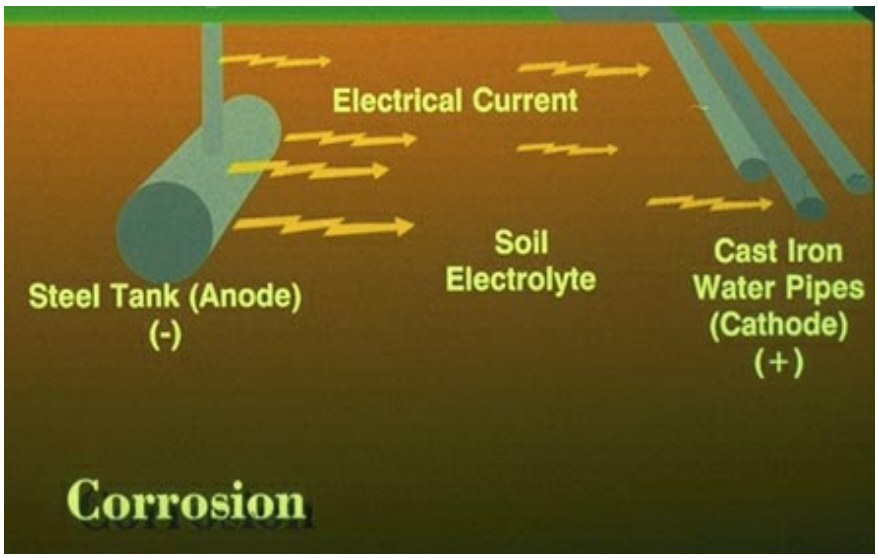
In the case of a steel tank that is corroding underground, the electrolyte is water. Even damp soil contains sufficient water for corrosion to occur. The electrical pathway is a means for electrons to travel easily between the anode and cathode. The metal itself usually serves as the electrical pathway. The anode is any place on the metal where electrons are leaving the metal via the electrical pathway and corrosion is occurring. The cathode is any place on the metal where the electrons are arriving from the electrical pathway and corrosion is not occurring.

There are two ways that corrosion can attack a metal: Over the entire surface of the metal so that it corrodes uniformly, or on a very small area so that corrosion is localized. When corrosion attacks the entire surface of an underground tank, the tank can last for a long time because a lot of metal must be converted to rust before the tank becomes structurally unsound enough to fail. However the most common form of corrosion is "point anode" corrosion or "pitting." In this type of corrosion, small areas on the tank rust, causing the tank to fail within a few years.

To prevent the tank corrosion, one or more of the components of corrosion must be eliminated.

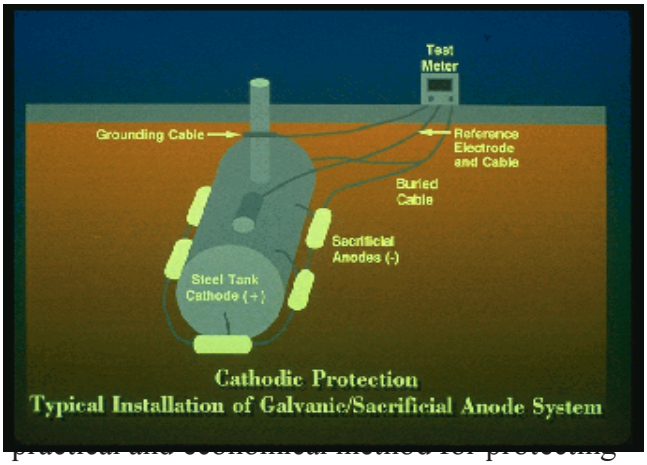
Electrolyte - Paint and asphalt coatings were applied to tanks in order to prevent moisture from coming in contact with the tank. These methods usually failed since the coatings were not carefully applied and were often damaged during tank transportation and installation. Fiberglass cladding, however, is a good alternative. About an 1/8th inch thick layer of resin and fiberglass is applied to the exterior of the tank to isolate the metal from soil moisture and, thus, prevent corrosion from occurring.

Electrical Pathways - Separating or isolating tanks and piping so that they are not electrically connected reduces the opportunity for creating anodes and cathodes on adjacent tanks or other storage tank system components and piping. But anodes and cathodes can still occur within a single tank or length of pipe. So, reducing electrical pathways is not a stand-alone method of corrosion protection.

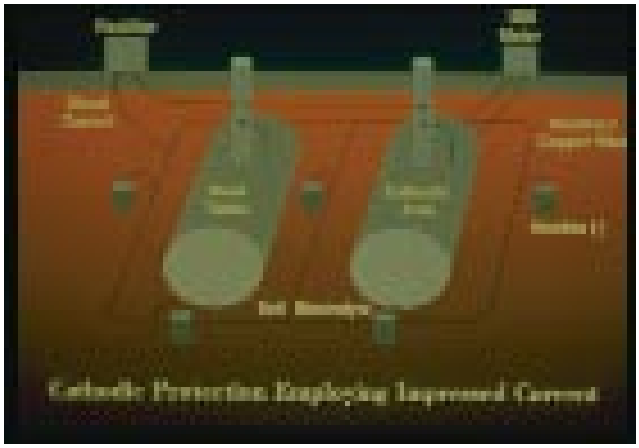


Anodes and Cathodes -
There is not a way to eliminate anodes and cathodes, but corrosion engineers have figured out how to use anodes and cathodes to protect the tank system from corroding. Keeping in mind that anodes corrode and cathodes do not, it is possible to create a situation where the tank and its piping become the cathode. This situation is the principle behind cathodic protection.

There are two types of cathodic protection used to protect steel tanks: “galvanic” or “sacrificial anode” and impressed current. In the galvanic system, zinc or magnesium anodes are connected to the tank. These metals corrode and the tank becomes the cathode and is protected. Eventually the zinc or magnesium anode corrodes away and needs to be replaced. This is a simple and inexpensive method that requires little maintenance. But it is only cost-effective when used to protect relatively small areas of exposed metal. Small nicks and scratches in otherwise well-coated structures that are electrically isolated can be protected effectively, as well as new underground tanks that are well coated with epoxy or urethane-based compounds such as the sti-P3[R] type of tank.



practical and economical method for protecting existing poorly coated or bare steel underground storage tank systems. The anodes connected to the tank are made of highly corrosion resistant materials such as graphite, high silicon cast iron or titanium coated with a metal oxide. The anodes are connected to an external DC power source, typically a rectifier which converts AC power to DC at a desired voltage. The positive terminal of the rectifier is electrically connected via cables to the anodes, and the negative terminal is connected to the structure to be protected, in this case the UST system. The UST system is protected because the current going to the UST system overcomes the corrosion-causing current normally flowing away from it.



The main advantage of impressed current systems is that they are not limited by the surface area of the metal being protected. If the tanks are in a highly corrosive soil conditions or there is a need for large amounts of protective current the amount of electricity produced by the rectifier is merely adjusted as well as the number and location of anodes.

Impressed current systems are much more sophisticated than the galvanic type; they must, therefore, be carefully designed by personnel who know what they are doing. (See article on pg #4.) An improperly designed impressed current system can cause an increase in the amount of corrosion on a storage system rather than protect it. Be sure the people you hire are qualified.

Monitoring Requirements

Monitoring is a critical factor in ensuring the long-term performance of a cathodic protection system. There are specific federal and state rules that regulate how the system is monitored. These regulations are enforced to help the tank owner prevent petroleum from leaking into the environment due to corrosion of the tank.

Galvanic system monitoring involves checking the voltage of the storage tank system relative to a reference cell. This test should be done by a qualified person. The system must be monitored within 6 months of installation and every three

Cathodic Protection cont.

years thereafter. Galvanic systems must also be monitored after any repair or construction activity which has taken place to ensure that anode wires are okay and that the cathodic protection system has not been affected. Federal rule requires that the last two inspections be kept on file. However, it is a good idea to keep all monitoring reports for as long as the system is operational.

Impressed current systems require two types of monitoring: a voltage measurement relative to a reference cell, and an additional measurement of the electrical output of the rectifier. The voltage measurement requirements are the same as for the galvanic system. The second measurement involves checking the rectifier every 60 days to be sure it is operational. Usually this means keeping a log of the voltage and amperage output of the rectifier. In most cases, this information can be read from meters that are built into the rectifier. The readings, which can be recorded by on-site personnel, should stay relatively constant over time. If there are any changes in the readings, then it is likely that something has affected the system and the corrosion engineer who designed the system should be notified immediately. Record keeping rules require that the last three inspections of the system be kept on file at the site.

Editor's Note: Most of this information was taken from an article on corrosion fundamentals in the January 1996 L.U.S.T. Line published by NEIWPCC.

Above Ground or Underground: Which Is Best?

Are you thinking of installing new tanks? Are you having trouble deciding between above ground storage tanks and underground storage tanks? EPA is putting together an outreach guide which should help you make that decision. Here are a few things to consider about ASTs and USTs:

	ASTs	USTs
Regulations	40 CFR part 112	40 CFR part 280 and 281
Leaks	Leaks from ASTs may be easier to identify, but they carry the added danger of flammability and possible danger from vapors.	Leaks from USTs are usually harder to detect, and could go unnoticed for longer periods of time without a robust monitoring system increasing the chance of a large, expensive cleanup.
Susceptible to Adverse Weather & Earthquake	ASTs are more susceptible to inclement weather conditions like tornadoes, lightening strikes, and high temperature changes. In earthquakes, ASTs are more subject to catastrophic failures.	USTs are less susceptible to inclement weather and large temperature change. They are also less susceptible to catastrophic failures but may suffer damage in earthquakes that is harder to detect and more expensive to repair.
Vehicular Traffic	More susceptible to damage from accidental collision.	More susceptible to damage from heavy loads from traffic over buried tanks.
Construction Considerations	Will incur additional regulation under fire protection rules regarding building setback distances and fire protection requirements. May have compatibility concerns with larger communities.	More difficult to construct initially, and to expand, replace, or move in the future.

Is Your Cathodic Protection Tester Qualified?

To ensure successful corrosion protection, it is important that you use qualified, trained personnel to design, install and monitor your cathodic protection system. So, how do you determine if your cathodic protection person is qualified? Federal rule 40 CFR 280.20(a) requires that a "corrosion expert" design the cathodic protection system, and that it is inspected and repaired in accordance with a code of practice developed by a nationally recognized association. A corrosion expert, as defined in the federal regulations, must demonstrate the education and training needed to qualify in the practice of corrosion control on buried metal tank systems. Proof of qualification can be demonstrated by either the person being a registered professional engineer with certification or licensing that includes education and experience in corrosion control of buried metal tank systems or be certified by the National Association of Corrosion Engineers (NACE). There are many NACE certification levels, starting with the lowest level of Corrosion Specialist-in-Training to the highest level of qualification: Corrosion Specialist. Only persons certified as either *Corrosion Specialists* or *Cathodic Protection Specialists* are qualified on the basis of training and work experience to design a cathodic protection system.

To test a cathodic protection system, federal regulations require that a Cathodic Protection tester be "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."

There are a number of NACE certifications that meet the requirements of a cathodic protection tester. The new *Cathodic Protection Testers* certification, *Corrosion Technician* certification and any higher level of NACE certifications would satisfy this requirement. NACE certification is not required to do cathodic protection testing, however, the testers must document an equivalent level of education and experience before the Utah DERR will accept a cathodic protection test.

It is very important that the people designing, installing and testing your cathodic protection system are qualified. You are counting on the cathodic protection system to protect your tank system from corroding and leaking fuel into the environment. If a tank system fails, you, the owner or operator might be held liable for any resulting loss of life, property loss, or damage to the environment if it can be shown that the underground tank was not adequately protected and qualified personnel were not used to design and install the system. If you have any questions contact David Wilson, Therron Blatter or Rick Saathoff at (801)-536-4100.

Protect Yourself

Verify that the person you contract with is qualified to do the work!

Are You Liable?

by Garl Fink, Questar Gas

Do you have any unforeseen liability from cathodic protection? If you own underground steel tanks with impressed current cathodic protection (CP), the answer could be yes. An impressed current CP system that has not been properly designed, installed and maintained can result in unintended interference with other buried metallic structures. In simple terms, impressed current from your system can flow onto foreign steel structures such as steel pipelines, eventually exiting and causing the steel structure to corrode. You can well imagine the potential liability if your CP system was to cause a natural gas pipeline or large diameter steel water line to leak!!

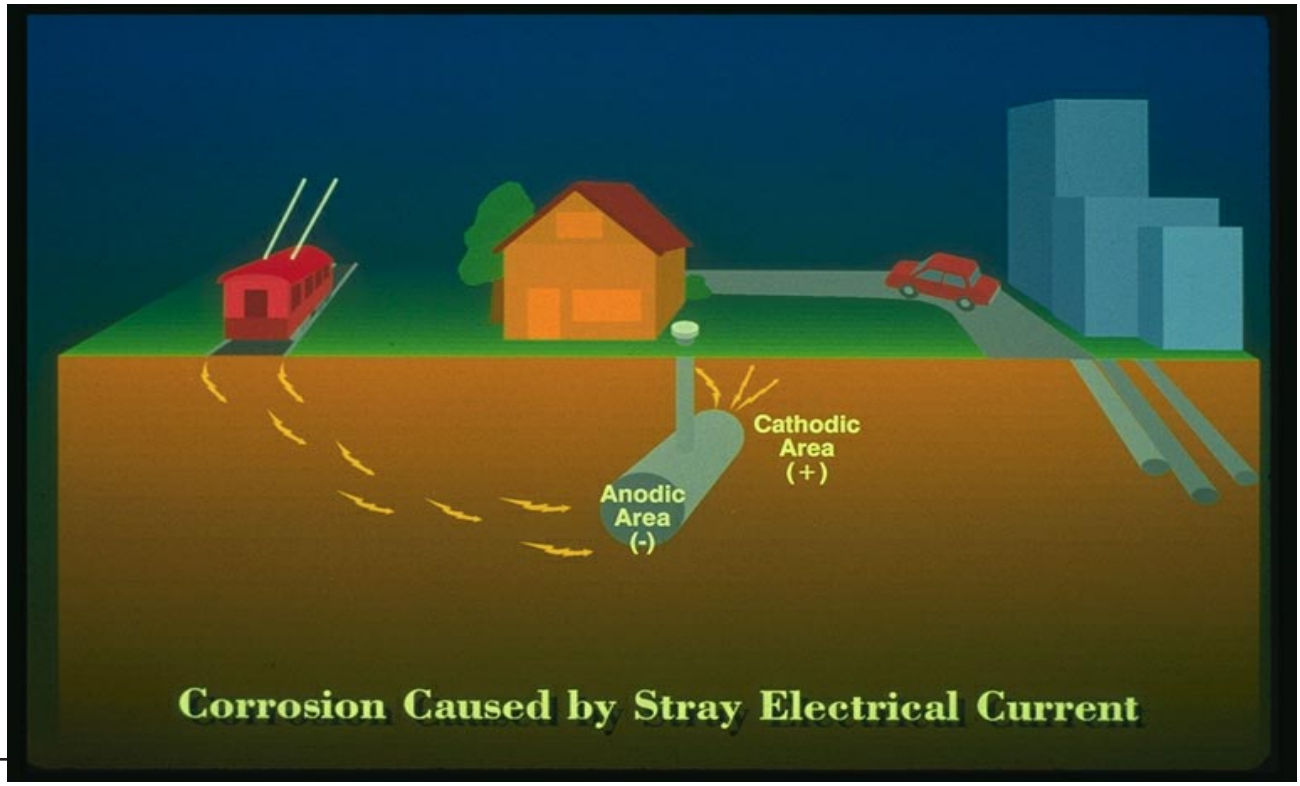
What can you do to avoid these type of liabilities? The answer is to make sure that you have a sound installation and that it is properly maintained. You should consider the following points:

■ Properly adjust the current output of your rectifier, ensuring adequate protection but not overprotecting. Overprotection increases your power costs and the likelihood of stray current that can be detrimental to others.

■ Look at whether your system is properly insulated from other metallic systems (gas, water, sewer, electric, canopies, etc.). If your system is electrically connected to other metallic systems, this can increase your potential for stray current flow.

■Know whether your installer checked your installation for possible stray current effects on adjacent structures, including municipal and utility lines. Ideally, your installer should have coordinated with these parties, but this often does not happen.

You may want to contact your cathodic protection installer or another properly qualified corrosion expert to assist you. If you detect any problems with stray current, work with the owners of the other steel structures. For more information, contact Garl Fink at (801)-324-3425.



Public Notification Requirements

By Mark Crim

Following the investigation of a petroleum release at an underground storage tank (UST) site, clean-up activities or corrective action, is often required. Because of this, a Corrective Action Plan (CAP) is required to be submitted to DERR, so that the owner's/operator's plans for clean-up can be reviewed for approval. A portion of this corrective action proposal must include notice to the public who may be affected by the clean-up activities.

PUBLIC NOTIFICATION

Prior to implementing any cleanup activity at a leaking UST site, the potentially affected public must be notified of the proposed corrective action. The Executive Secretary (UST) requires public notification by a means designed to reach the segment of the public who may be directly affected by the release or the corrective action process. The basis for these requirements is found in the federal rules under 40 CFR Part 280.67.

NOTIFICATION METHODS

Notification methods may include personal contact, the distribution or posting of flyers, a notice in a local newspaper, block advertisements, public service announcements, publication in a state register, letters to individuals or concerned communities, public meeting, or other appropriate methods.

WHAT THE NOTICE SHOULD CONTAIN

- Name and address of the LUST release site.
- Brief summary of release and site conditions.
- Purpose of corrective action and location(s) of activity. Typically, corrective action takes place at the location of the release site, a single location. However, certain cleanup efforts do include off-site treatment, such as soil aeration piles on private property at a different location. In this case, be sure to include a description of the project as a whole, and notify all potentially concerned parties in each area.
- DERR project manager's name and phone number.
- Location, dates and times where the CAP can be reviewed.

As a follow-up to notifying the public, the DERR project manager will want to receive documentation that the notification requirements have been met. This may be done by providing either a copy of the newspaper article or handbills that were posted, a list of homes, businesses and individuals that were notified, etc. This kind of documentation is expected and preparation should be made to provide it as part of your public notification plan.

Following the above-listed guidelines and keeping in touch with the DERR project manager will hopefully keep the affected public informed and calm and the corrective action process running smoothly. Because the last thing you want is for the public to be alarmed about your corrective action process, possible preventing or slowing down the clean-up process.

UST Certification Renewals

Renewal exams are administered the 1st Tuesday of each month at 9:00 am at the DERR. If you have any questions contact Tamie Call at (801)-536-4163.

Utah Division of Environmental Response and Remediation
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Salt Lake City, Utah 84116

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UST RELEASE is published periodically, free-of-charge, for underground storage tank owners and operators and other interested individuals and organizations. It is for education and information and is not intended to replace UST regulations or Utah standards and guidelines.

For additional copies, questions or concerns about the newsletter contact Tamie Call at (801) 536-4100 or write: UST RELEASE, 168 North 1950 West, 1st floor, Salt Lake City, UT 84116.

Y2K

Are you ready for the year 2000? More importantly is your computerized UST system ready for the year 2000? Many computer systems were programmed to read the year as a two digit number. For example, the year 1999 would be stored and viewed as "99". But what happens January 1, 2000? Will the computer recognize the year as 2000 or will it think it is the year 1900?

Many of today's automatic tank gauges, dispensers, cathodic protection systems, pump controllers, console systems, leak detectors, fuel management systems, tank monitors, POS systems, card readers, car washes, etc. contain microprocessors. These microprocessors may or may not be programmed to accept the year 2000. When the year 2000 arrives, it could trigger one or more malfunctions within your system. The result could be erratic leak detection, sales monitoring or even a total system failure.

To protect yourself from having Y2K problems with your UST system, call you equipment supplier/installer right away to verify that your systems and equipment are "Y2K" capable or look up the Petroleum Equipment Institute homepage at *www.peinet.org*. PEI has gathered information from PEI Manufacturer Division members regarding the Y2K compliance status of systems or products that they produce. By acting now you should have enough time to make any necessary changes before it becomes a problem.