ADEQ Arizona Department of Environmental Quality

Cathodic Protection for USTs

Protecting Underground Storage Tank (UST) Systems from Corrosion

WHAT IS IT?

- Cathodic protection shields steel UST systems from corrosion that causes deterioration and potential failure of the UST.

- There are two types of cathodic protection systems:
  1. Galvanic Systems (Sacrificial Anodes)
  2. Impressed (Induced) Current Systems

WILL YOU BE IN COMPLIANCE?

- Adding cathodic protection along with spill and overfill protection meets the EPA 1998 upgrade requirements (hyperlink) for existing USTs provided the UST system already has leak detection installed.
- Cathodic protection can only be added on tanks which are structurally sound as determined by an integrity assessment test. Contact the UST section for integrity assessment methodologies.
- Cathodic protection can also protect metal piping associated with the UST system.

REGULATORY REQUIREMENTS & DOCUMENTATION

- State law requires that field-installed cathodic protection systems at UST sites be designed by a corrosion expert. Visit the NACE website: www.nace.org or contact NACE's customer service at (281) 228-6200 for a list of corrosion experts.

TESTING & RECORD KEEPING

- Cathodic Protection systems must be tested by a cathodic protection tester certified by ADEQ within six months of UST installation or repair, and at least every three years thereafter. Call 602-771-4316, or 1-800-234-5677, extension 771-4316 for a copy of the ADEQ-certified list of cathodic protection testers.
- Keep the results of the last two tests to document that the cathodic protection is working.
- Additional requirements for an Impressed Current system:

  1. Inspect an impressed current system every 60 days to verify that the system is operating.
  2. Keep the results of your last three (3) 60-day inspections to document that the impressed current system is operating properly.

HOW DOES CATHODIC PROTECTION WORK?

A. Galvanic Systems (Sacrificial Anodes)

1. Sacrificial anodes are pieces of metal attached to the UST system that are more electrically active than the steel UST system. Because these anodes are more active, the corrosive current will exit from them rather than the UST system. Thus, the UST system is protected while the attached anode is "sacrificed."

2. Sacrificial anodes can be attached to existing bare steel USTs or to new coated steel new USTs for a pre-engineered cathodic protection system.

3. If the sacrificial anodes are attached to a coated-steel UST, the coating must be of a suitable dielectric material. In other words, the coating will electrically isolate the UST from its environment and meet applicable industry codes. An asphalt coating is not considered a suitable dielectric coating.

4. For all galvanic system, depleted anodes must be replaced for continued cathodic protection of the UST system.

HOW DOES CATHODIC PROTECTION WORK?
(continued)

B. Impressed (induced) Current Systems

1. An impressed current cathodic protection system consists of anodes, cathodes, a rectifier and the soil.

2. The rectifier converts the alternating current to direct current. The direct current is then sent through an insulated copper wire to anodes that are buried in the soil near the UST system.

3. Typical anode materials are ceramic, high silicon cast iron, or graphite. Ceramic anodes are not consumed, whereas high silicon cast iron and graphite anodes partially dissolve each year and must be replaced over time.

4. The direct current then flows from the anode through the soil to the UST system, which acts as the cathode, and back to the rectifier through another insulated copper wire.

5. As a result of the electrochemical properties of the impressed current cathodic protection system, corrosion takes place only at the anodes and not at the UST system.

6. Depleted anodes must be replaced for continued cathodic protection of the UST system.

CHECKLIST

- ☐ Impressed Current CP system checked every 60 days?
- ☐ Galvanic system tested within six month of installation?
- ☐ Galvanic system tested every three years?
- ☐ CP system repaired by a corrosion protection expert?
- ☐ Depleted anodes in galvanic system replaced?
- ☐ Documentation of CP system designer credentials maintained?

FOR MORE INFORMATION CONTACT:

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In the event of any discrepancy between this information and the Arizona Revised Statutes or Arizona Administrative Code, the statutes or rules shall take precedence.

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