The Steel Tank Institute receives many questions from all areas of industry, regulators, tank owners, contractors, etc. Lately, we have received many questions regarding the possible impact on a sti-P3® when an impressed current cathodic protection system is installed near by. From time to time, we print these questions for the benefit of our readers.

Q: I have four tanks at my site. Two of the tanks are unprotected steel and two are sti-P3® tanks. I have heard that if I install an impressed current cathodic protection system on my unprotected tanks that I need to tie in my sti-P3® tanks. Is this true?

A: It is quite possible that you need to have your impressed current system designed to include your sti-P3® tanks. This depends mainly on the distance and placement of the sti-P3® tanks, your other tanks and piping, and the impressed current anodes. When installing an impressed current system, you always need to consider the effect the impressed current system may have on other structures.

Q: How is an impressed current cathodic protection system different from the cathodic protection system on a sti-P3® tank?

A: A sti-P3® tank uses the natural process of dissimilar metal corrosion and uses it to our advantage. For instance, we know if steel is connected to copper, the steel will become the anode and corrode because the steel has a more negative potential than copper. So a sti-P3® tank is made of steel with zinc (or magnesium) anodes welded to the tank, which have a more negative potential than steel. That’s why the zinc anodes corrode but the steel doesn’t!

An impressed current system works in somewhat the same way. With the P3 tank, a small dc current flow is actually generated between the tank and the zinc anode. An impressed current system uses ordinary ac electricity, just like what comes out of the outlets in your house, and with the help of a rectifier converts it to a dc current, similar to a battery charger. The electrical current is sent from the rectifier to special anodes placed in the soil near the tanks, where the current is distributed through the soil to your tanks and potentially to other metallic structures. With the use of an impressed current system, it is possible to generate a much greater current output than what is generated by the anodes connected to your sti-P3® tank.

Q: How can this create a problem for my sti-P3 tank?

A: In the process of protecting the steel tank with impressed current, the current can also flow on and off other structures. Where it leaves, the current will actually create a corrosion cell, which is obviously something to be avoided. This type of corrosion is
called stray current corrosion and can readily be identified, and prevented, by a corrosion expert.

Q: It sounds like impressed current cathodic protection, if not designed and installed correctly, could also be detrimental to other types of tanks and buried metallic structures.

A: Yes, you are correct. When installing an impressed current system, the designer needs to be aware of all buried structures in the vicinity. This includes natural gas lines, water lines, ACT-100 tanks, buried steel tanks, and any buried structure on the site.

Q: Will the impressed current system at my site affect my sti-P3® warranty?

A: This is a difficult question to answer. Whenever a tank fails, all the circumstances related to the failure must be investigated. If the tank fails due to a problem created by something unrelated to the original design or construction of the tank, then the warranty may be voided.

If you have a question you’d like answered, please send it to:

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