**Section 175.510 Corrosion Protection**

In all situations, no matter which method is used to assess the integrity of the tank prior to addition of cathodic protection, the cathodic protection system being field installed in Illinois must be designed by a corrosion expert who is NACE certified in cathodic protection design or by a Licensed Professional Engineer with the state who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks. Those contractors installing the cathodic protection systems in Illinois must be licensed as cathodic protection installers. These contractors must successfully pass the International Code Council (ICC) certification exam module for cathodic protection.

a) Cathodic Protection. A tank may be upgraded by cathodic protection if the cathodic protection system meets the requirements of 41 Ill. Adm. Code 172, 174, 175, 176 and 177, and the integrity of the tank is ensured using one of the following methods:

1) To be suitable for upgrading by cathodic protection, the integrity of the tank must be ensured by one of the following methods:

A) For tanks installed for less than 10 years, one of the following requirements applies:

i) The tank is internally inspected and assessed to ensure that the tank is structurally sound and free of corrosion holes prior to installing the cathodic protection system. Two tank precision tests must also be conducted that meet the requirements of OSFM precision tank testing. The first precision test shall be conducted prior to the installation of the cathodic protection system. The second precision test shall be conducted between 3 and 6 months following the first operation of the installed cathodic protection system. Both precision tests must indicate tightness of the tanks; or

ii) Use of alternative methods approved by OSFM. These acceptable alternative methods are indicated in subsection (a)(1)(B) for tanks that are over 10 years old.

B) For tanks installed for more than 10 years, the following methods apply:

i) An invasive inspection method that ensures the tank is internally inspected and assessed to ensure that the tank is structurally sound and free of corrosion holes prior to installing the cathodic system. The internal inspection procedures shall follow the requirements of NLPA 631;

ii) An invasive remote video camera test is conducted prior to the installation of the cathodic protection system. The video system must be capable of recording a video survey of the interior surface of the tank with a suitable lighting source; or

iii) The tanks are assessed for corrosion holes by other methods determined by OSFM, to prevent releases in a manner that is no less protective of human health and the environment than subsections (a)(1)(B)(i) and (ii).

2) OSFM requires a tank integrity assessment even if both cathodic protection and interior lining systems are being installed. If the cathodic protection and interior lining are installed at the same time, only one approved integrity assessment is required. Even if both systems have been installed, OSFM requires routine inspection and maintenance of both systems to continue.

3) USTs equipped with both interior lining and cathodic protection (sacrificial anodes or impressed current).

A) The following maintenance procedures shall apply:

i) Sacrificial anodes must be tested according to the requirements of subsection (f).

ii) Impressed current records of operation must be recorded every 30 days and records kept on site for 2 years. The system must be tested annually according to the requirements of subsection (f).

iii) As of September 1, 2010, some facilities may exist that had been previously granted an OSFM waiver for the UST lining maintenance requirements based upon original field notes from the initial lining, of an invasive method of initial tank integrity assessment verifying that there were no holes in the tank. For these systems, only the external cathodic protection system must be maintained and tested. This is contingent upon the original field notes being available, and a letter from OSFM existing from that time to verify the waiver was granted.

B) For those USTs where a non-invasive tank integrity assessment method was used or if there were any holes present in the tank, regular interior lining inspections must continue as described in Section 175.500.

b) ACT-100 Tanks Installed with Sacrificial Anodes. Owners of ACT-100 tanks meeting STI F894, incorporated by reference in 41 Ill. Adm. Code 174.210, and able to produce ACT-100 warranty papers may choose the steel-FRP composite design as a sole method of corrosion protection instead of maintaining the sacrificial anodes.

c) Upgrades to Combine Internal Lining with Cathodic Protection. Some tanks may exist that were previously upgraded by both internal lining and cathodic protection. Such tanks were to be inspected for both the internal lining and the cathodic protection within 90 days after the upgrade and must continue to be maintained by regular inspections of the cathodic protection system pursuant to the requirements of this Section.

d) Piping Corrosion Protection Requirements. All UST metal product piping that is in contact with backfill, ground or water shall be cathodically protected. All metal risers, vents and fills in contact with backfill, ground or water shall be dielectrically coated. Shrink-wrap or boots are not acceptable as a form of cathodic protection in a water environment.

e) Wiring of all associated electrical equipment shall conform to the requirements of Section 175.425 and shall also conform to the following requirements:

1) All wiring that is connected to any anode of an impressed current system shall be no less than No. 10 stranded, with jacketing that is suitable for direct burial and that is petroleum or hazard resistant for the product conveyed. Such jacketing is to have a thickness sufficient to cause the wiring to have a diameter of at least 5/16 inch. Systems existing prior to May 1, 2003 may remain.

2) All wiring connected to any anode of a sacrificial anode system shall be suitable for direct burial and shall be resistant to petroleum and/or hazardous substances.

3) All structural lead wiring of any cathodic protection system shall be suitable for direct burial and shall be petroleum and/or hazard resistant.

4) For installation of cathodic protection systems to facilities existing prior to May 1, 2003, existing anode wiring may be replaced into existing pavement saw-cuts, provided that the following conditions are met:

A) No part of the wiring is less than one inch below the finished pavement surface, and provided that the portion of the saw-cut groove above the wiring is filled with a combination of at least ⅜ inch of backer rod and at least ½ inch of self-leveling caulk suitable as a concrete filler.

B) Structure lead wiring of impressed current systems shall consist of at least 2 separate leads. Such leads running from the junction box or rectifier to the UST structures must be in separate saw-cuts, jumpering from one UST structure to the next. One lead shall connect to the first structure to be protected and continue on to all structures in the UST. The second lead will connect to the last structure to be protected. Such loop is to ensure that if one lead were to become cut or disconnected, the other lead would ensure the continued connection of the UST structures and the junction box or rectifier.

C) All wiring from anodes shall terminate and be identified (as to location per approved site plan), in strategically located junction boxes, placed in and around the protected field. This will facilitate the testing of each anode.

D) Any additions or extensions done to the existing network must conform to Section 175.425(a).

5) Beginning May 1, 2003 for installation of cathodic protection systems, all wiring running outside of manholes or sumps shall be located at least 12 inches below the finished grade and installed in conduit approved for petroleum and/or hazardous installations.

f) Operation and Maintenance of Cathodic Protection. Owners or operators of steel USTs with corrosion protection shall comply with the following requirements to ensure that releases due to corrosion are prevented for as long as the UST is used to store regulated substances:

1) All corrosion protection systems shall 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, backfill or water.

2) All USTs equipped with sacrificial anode or impressed current cathodic protection systems shall be regularly tested and inspected for proper operation, including when being first put into operation, by an OSFM-licensed contractor who has licensure in the cathodic protection module, using an employee who has successfully passed the International Code Council (ICC) certification exam module for cathodic protection. Such testing shall be in accordance with the following requirements:

A) Frequency.

i) Sacrificial anodes shall be tested every 3 years as long as testing results are -850 millivolts or a higher negative number. In the event testing results do not meet the -850 millivolt requirement, the anodes shall be replaced. This requirement applies to all sacrificial anodes, including wristband and spike anodes.

ii) Impressed current systems shall be tested annually as long as testing results are -850 millivolts or a higher negative number. In the event testing results do not meet the -850 millivolt requirement, the impressed current system shall be repaired or upgraded as needed to meet the -850 millivolt requirement.

iii) All cathodic protection systems shall be re-tested no less than 24 weeks and no more than 28 weeks from the date of installation or repairs.

B) Inspection Criteria. The criteria that are used to determine that cathodic protection is adequate as required by this subsection (f)(2)(B) shall be in accordance with NACE SP0285 and SP0169, incorporated by reference in 41 Ill. Adm. Code 174.210. Subject to the technical applicability of these criteria given actual site conditions, one or more of the following criteria shall apply for adequacy of cathodic protection. Cathodic protection shall be repaired or replaced if it fails to meet the standards provided in this subsection (f)(2)(B).

i) A negative (cathodic) potential of -850 millivolts or a higher negative number with cathodic protection applied. This potential is measured with respect to a saturated copper/copper sulfate reference electrode contacting the electrolyte.

ii) A minimum 100 millivolt of cathodic polarization between the structure and a saturated copper/copper sulfate reference electrode contacting the electrolyte. Such polarization shall be determined from the taking of a valid "instant-off" test, that, for each testing point, determines the voltage reading at the second drop in voltage following the interruption in cathodic protection being applied, and determines if the voltage reading is at least 100 millivolts higher than either the native reading or any other reading after the structure has had time to depolarize with no cathodic protection applied.

3) USTs with impressed current cathodic protection systems shall be inspected every 30 days, to ensure the equipment is running properly.

4) For USTs using cathodic protection, records of the operation of the cathodic protection shall be maintained to demonstrate compliance with the performance standards in this Section. These records shall provide the following:

A) The results of 6-month testing for sacrificial anode systems must be maintained on site for 2 years;

B) All records from the last 2 cathodic protection total system tests by a qualified cathodic protection tester pursuant to a 3-year cycle must be maintained on site;

C) Impressed current systems must be inspected every 30 days and reports or a log maintained that shows date of inspection, initials of inspector, hour, volt and amp readings, and power on verification. A minimum of 2 years of records shall be kept on site; and

D) The records from the impressed current annual test conducted by an OSFM licensed contractor shall be kept on site for 2 years.

5) Alternative methods of corrosion protection may be used if approved in writing by OSFM, provided they are no less protective of human health or the environment.

(Source: Amended at 47 Ill. Reg. 6837, effective May 2, 2023)