

### SCOPE

- I 1.1 This practice covers the design, application, and installation of cathodic protection systems to prevent corrosion of piping and structures in contact with corrosive soil or water.
- I 1.2 **An asterisk (\*)** indicates that a decision by the Purchaser is required or that additional information is furnished by the Purchaser.

### SUMMARY OF ADDITIONAL REQUIREMENTS

- O 2.1 Vendor shall comply with **local, State or Federal rules and regulations** concerning design, installation and operation of cathodic protection systems.
- I 2.2 **Table 1** lists the standards to be used with this practice.

**TABLE 1**

| STANDARDS                                                 |                                                                                         |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>NACE (National Association of Corrosion Engineers)</b> |                                                                                         |
| RP0169                                                    | Control of External Corrosion on Underground or Submerged Metallic Piping Systems       |
| RP0176                                                    | Corrosion Control of Steel Fixed Off-Shore Platforms                                    |
| RP0193                                                    | External Cathodic Protection of On-Grade Metallic Storage Tank Bottoms                  |
| RP0196                                                    | Galvanic Anode Cathodic Protection of Internal Surfaces of Steel Water Storage Tanks    |
| RP0285                                                    | Corrosion Control of Underground Storage Tank Systems by Cathodic Protection            |
| RP0388                                                    | Impressed Current Cathodic Protection of Internal Surfaces of Steel Water Storage Tanks |
| RP0675                                                    | Control of Corrosion on Off-Shore Pipelines                                             |

### DOCUMENTATION

#### PROPOSAL INFORMATION

- R \* 3.1 **Vendor Qualification.** The Vendor shall submit a list of recent installations indicating service, type of system, ground bed characteristic, year of installation, Owner, and name of contact.
- O,R \* 3.2 The Vendor shall submit the following proposal information to the Purchaser for approval by the Owner's Engineer:
- Detailed designs of proposed protection systems based on a continuous operation of the system for the specified design life of the structure or equipment to be protected, or 15 years whichever is shorter.
  - Installation requirements of any bonds necessary between structures which may be subject to cathodic interference.
  - Details for system commissioning.
  - The design and location of electrical insulating flanges, and fittings.
  - The design and location of monitoring points.
  - The design and location of permanent reference electrodes or plastic perforated pipe undertank potential measurement systems. The latter is preferred for storage tanks.

### DESIGN AND INSTALLATION

- I,R \* 4.1 **Cathodic protection** will be used for the equipment, piping, and structures as listed in **Table 2** to the extent indicated. Design and installation shall conform to the referenced standard. The details of the protective coating system applied to the equipment or structures will be furnished by the Purchaser.

**TABLE 2  
CATHODIC PROTECTION**

| EQUIPMENT AND STRUCTURES                                                                                  | CATHODIC PROTECTION<br>SPECIFIC REQUIREMENTS                                                                                                                                                                                                                                                             | STANDARD         |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Piping</b>                                                                                             |                                                                                                                                                                                                                                                                                                          |                  |
| 1. Underground carbon steel piping system handling hydrocarbons.                                          | Cathodic protection required only for piping buried in soils having resistivity less than 10,000 ohm-cm, if specified by the Purchaser.                                                                                                                                                                  | RP0169           |
| 2. Underground piping systems handling cooling water or firewater, located outside of process unit areas. | Cathodic protection required only for piping buried in soils having resistivity less than 10,000 ohm-cm, if specified by the Purchaser.                                                                                                                                                                  | RP0169           |
| 3. Underwater piping systems                                                                              | Cathodic protection required for complete system.                                                                                                                                                                                                                                                        | RP0675           |
| <b>Tankage</b>                                                                                            |                                                                                                                                                                                                                                                                                                          |                  |
| 1. External tank bottoms                                                                                  | Cathodic protection required unless it can be demonstrated that there is no soilside corrosion. (1)                                                                                                                                                                                                      | RP0193           |
| 2. Underground storage tanks                                                                              |                                                                                                                                                                                                                                                                                                          | RP0285           |
| <b>Marine Facilities</b>                                                                                  |                                                                                                                                                                                                                                                                                                          |                  |
| 1. Steel piers                                                                                            | Cathodic protection required for underwater structure.<br><b>Note:</b> Cathodic protection achieved through the use of sacrificial aluminum anode system preferred, provided its cost is competitive with the impressed current system taking into account installation operating and maintenance costs. | RP0176           |
| 2. Steel piles, pipe or structural                                                                        |                                                                                                                                                                                                                                                                                                          |                  |
| 3. Steel sheet piling (if specified)                                                                      |                                                                                                                                                                                                                                                                                                          |                  |
| 4. Mooring Buoys or Other Floating Structures                                                             |                                                                                                                                                                                                                                                                                                          |                  |
| <b>Water Storage Tanks</b>                                                                                | Cathodic protection required for salt water. Purchaser will determine need in fresh water tanks.                                                                                                                                                                                                         | RP0196<br>RP0388 |

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**Note:**

- (1) The Purchaser shall specify if a non-permeable membrane is installed within the tank foundation of an aboveground storage tank or a double bottom leak detection system is employed and the need for a c.p. system.

**TESTING, EVALUATION AND DESIGN**

- R,M \* 5.1 The Vendor shall supply all information, drawings, testings and commissioning data as required by the referenced standard.

**Revision Memo**

|             |                                                       |
|-------------|-------------------------------------------------------|
| 9/68        | Original Issue of Basic Practice                      |
| 6/71        | Revision 1                                            |
| 1/76        | Revision 2                                            |
| 1/81        | Revision 3                                            |
| 9/88        | Revision 4                                            |
| 12/91       | Revision 5                                            |
| 12/92       | Revision 6                                            |
| 12/93       | Revision 7                                            |
| 3/98        | Revision 0 - Original Issue of International Practice |
| <b>6/00</b> | <b>Revision 1</b>                                     |

This is a reaffirmation of Revision 0, March 1998, with minor editorial changes only.

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