SOUTH CAROLINA

OFFICE OF REGULATORY STAFF

PIPELINE SAFETY INSPECTION

REPORT OF

CORROSION CONTROL

MONITORING PLAN

OPERATOR (A-O) (P-Z)

INSPECTOR(S):

DATE

Revised 6/2012

The Office of Regulatory Staff of South Carolina

Pipeline Safety Corrosion Control Inspection Form

OPERATOR (A-O) (P-Z)

LOCATION

DATE

ORS INSPECTOR(S):

NAME AND TITLE OF OPERATOR PERSONNEL PERFORMING JOB TASK:

NAME:

TITLE:

IS OPERATOR PERSONNEL QUALIFIED TO PERFORM THE JOB TASK?

DOES THE PERSON PERFORMING THE TASK HAVE OPERATOR QUALIFICATION Requirements?

DOCUMENTATION ON THE JOB SITE?

Comments:

Corrosion Control **YES** **NO**

192.453 (1) Is the corrosion control program carried out by or under a qualified person? ☐ ☐

192.455 (2) Do all steel lines have protective coating meeting requirements of 192.461? ☐ ☐

(3) Have all lines installed after July 31, 1971 been placed under protection within one year ? ☐ ☐

192.457 (4) Have all steel distribution lines installed prior to August 1, 1971 been placed under cathodic protection? ☐ ☐

(5) Is the operator taking steps to protect mains and services in areas of active corrosion? ☐ ☐

192.465 (6) Does the operator take CP readings once each calendar year but with intervals not exceeding 15 months to determine the status of the CP applied? ☐ ☐

(7) The operator's distribution system is protected by _____ anodes and/or rectifiers_____. ☐ ☐

(8) If the operator's system is protected by rectifiers are they checked six times each year but with intervals not exceeding 2 1/5 months for proper operation? ☐ ☐

(9) Does the operator take prompt remedial action to correct any deficiencies indicated by monitoring? ☐ ☐

192.467 (10) External corrosion control: Electrical isolation – Is the operator complying with all portions of this regulation? ☐ ☐

192.481 (11) Does the operator after meeting the requirements of 192.479(b)(3) (Clean or coat areas of atmospheric corrosion) continue to evaluate all above ground piping and take remedial action every three (3)years? ☐ ☐

192.491 (12) Does the operator maintain the following for the life of the protected pipeline: ☐ ☐

(a) Maps showing the location of protected pipe? ☐ ☐

(b) Did ORS staff review maps ☐ ☐

(c) Records of each test survey? ☐ ☐

(d) Did ORS staff records of each test survey ☐ ☐

(13) ORS staff inspected and took readings of the following locations to verify compliance. (See attachment report) ☐ ☐

OFFICE OF REGULATORY STAFF
OF SOUTH CAROLINA
CORROSION CONTROL MONITORING REPORT

UTILITY AND LOCATION:

DATE: **REPORT BY:**

ADDRESS	FACILITY	RESULT	TYPE SOIL	WET/DRY	CRITERIA

Guide material 192.465 External corrosion control: monitoring

1 MONITORING METHODS

Monitoring requirements of pipeline cathodic protection systems may be satisfied by on-site, remote, or other testing and inspection methods.

2 PRACTICALITY OF ELECTRICAL SURVEYS *(No.5 of the guide material under §192.457.)*

5 USING ELECTRICAL-TYPE SURVEYS

5.1 Methods.

The following are electrical-type surveys that have been commonly used with success.

(a) Pipe-to-soil potential measurement.

(b) Soil resistivity measurement.

(c) Dual electrode or earth gradient measurement.

(d) Line current measurement.

5.2 Applicability.

Where electrical-type surveys are considered for use in determining corrosion areas, the operator should consider the following conditions that may make these surveys impractical to apply or ineffective, or may result in unreliable data.

(a) Stray earth gradient. Telluric currents, iron ore deposits, A.C. induction and other sources create stray earth potential gradients that may make it difficult to reliably interpret electrical-type surveys.

(b) Lack of electrical continuity. The facility may not be electrically continuous due to unknown insulators or other high resistance joining methods (such as gasketed joints and, on occasion, lack of continuity on threaded connections). These discontinuities may be intermittent with time.

(c) Pavement and congestion. Electrical-type surveys are complicated in congested areas where frequent pipe contact is necessary. Paved streets and sidewalks prevent ready access to the soil contact required for the copper sulfate electrode and also limit ability to contact the pipe itself.

(d) Electrical isolation. Facilities that are not electrically isolated are often in direct contact with other metallic structures or in indirect contact with these structures through the earth, house plumbing, wiring or electrical grounding systems. Where such contacts exist, electrical surveys are either ineffective or may erroneously indicate corrosion problems. For example, an unknown contact between a steel pipeline and aluminum, zinc or galvanized metal would indicate an electro-negative peak on a pipe-to-soil survey that may erroneously be interpreted as a corrosive condition on the pipeline.

(e) Shielding of current. Cathodic protection current may be shielded from the pipeline by nearby objects close to the pipeline. The current can be picked up by nearby conducting elements such as casings, parallel or crossing lines, scrap metal, or other foreign objects. Nonconducting elements close to the pipeline can also shield or limit the current to the pipeline. Such elements could be disbonded coating, rocks, solid-type rock shield (i.e., material that would shield cathodic protection), rock ledges or concrete structures. The shielding effects can go undetected by an electrical survey due to the many combinations of the size and location of shielding objects.

(f) Sufficiency of history and details of facilities. Correct interpretation of electrical measurements on gas facilities depends on detailed knowledge of the age and types of material installed, maintenance history, location of galvanic anodes, coating, foreign facilities, location and types of service lines, joining methods and unusual soil conditions. For example, the installation of insulators after the facilities have been in service will alter the significance of previous electrical survey data.

(g) Other conditions.

(1) Extremely dry soil.

(2) Adjacent underground facilities.

(h) Practicability. The extreme hardship or expense of obtaining a meaningful electrical survey may render a survey inappropriate for a given pipeline because of the above or other conditions.

3 MONITORING OF CATHODICALLY PROTECTED PIPELINES (§192.465(a))

(a) "Active" corrosion areas. See guide material under §192.457.
For areas of local corrosion protection provided by galvanic anodes at individual locations of "active" corrosion, the anodes need to provide a level of cathodic protection that complies with §192.463. Monitoring is mandatory in accordance with §192.465(a).

(b) "Not active" corrosion areas.
For areas of local protection provided by galvanic anodes at individual locations of "not active" corrosion, the corrosion protection levels are not subject to the requirements of §192.463. Such "voluntarily installed" anodes need not be monitored in accordance with §192.465(a), but the pipeline must be reevaluated every three years in accordance with §192.465(e).

4 REMEDIAL ACTION

(a) Common corrosion control methods include coating, cathodic protection, and electrical isolation.

Cathodic protection systems typically use galvanic anodes or impressed current (rectifiers). Other corrosion control devices may include electrical isolators, interference bonds, diodes, and reverse current switches.

(b) Remedial action is required whenever it is determined that the cathodic protection or other installed corrosion control methods are not operating effectively.

(c) The specific remedial action to be taken depends on the type of corrosion control method installed and the problem encountered. In certain situations, the deficiency can be corrected by modifying existing corrosion control methods (e.g., increasing output from adjacent rectifiers).

(d) Operators are required to take prompt remedial action to correct deficiencies indicated by monitoring. Remedial action should correct the deficiency before the next monitoring cycle required by §192.465. However, for monitoring cycles greater than one year, remedial action should be completed within 15 months of discovery.

Example: It is discovered that pipe coating has deteriorated and that the existing corrosion control system is unable to achieve the desired cathodic protection level. The operator should initiate and document action taken to achieve the acceptable cathodic protection level before the next monitoring cycle. Remedial action might include the following.

(1) Installing additional cathodic protection,

(2) Recoating the pipe to meet the requirements of §192.461, or

(2) Replacing the pipe.

(e) If remedial action cannot be completed prior to the next scheduled monitoring cycle, the operator should document the actions taken to correct the deficiency and the expected timeframe for completion.