TR Number	**22-60**
Primary	**192.465**
Purpose	**Review and develop GM as appropriate in light of Amendment 192-132**
Origin/Rationale	**Amdt. 192-132**
Notes	**Corrosion Monitoring**
Assigned to	**IM/CORR Task Group**

Note: *Revisions are shown in yellow highlight and red font.*

[Editorial note: updated GM to reflect Addendum 4 version, these changes are in green font below.]

Section 192.465

~~*This guide material is under review following Amendment 192-132.*~~

1 METHODS FOR MONITORING CATHODICALLY PROTECTED PIPELINES ...

2 PERIODIC INSPECTION OF CATHODIC PROTECTION RECTIFIERS AND IMPRESSED CURRENT POWER SOURCES (§192.465(b)) ...

3 REMEDIAL ACTION TO CORRECT DEFICIENCIES FOUND BY MONITORING

(a) Common corrosion control methods include coating, CP, and electrical isolation. CP 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) Operators should take r~~R~~emedial action ~~is required~~ whenever it is determined that the CP or other installed corrosion control methods are not operating effectively. If remotely read rectifiers indicate potential deficiencies (e.g., voltage/amperage out of acceptable range, loss of power, loss of signal), operators must have procedures to initiate an onsite investigation. (§192.465(d)).

(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) ~~Per §192.465(d), O~~perators must ~~are required to take~~ promptly ~~remedial action to~~ correct deficiencies indicated by the inspection and testing required in §192.465(a), (b), and (c) (§192.465(d)) ~~monitoring~~.

~~(1)~~ Remedial action for distribution line operators 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.

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

(i) Installing additional CP.~~,~~

(ii) Recoating the pipe to meet the requirements of §192.461.~~, or~~

(iii) Mitigation of ~~any~~ interference with the pipeline's cathodic protection effectiveness.~~, or~~

(iv) Replacing the pipe.

~~(2) Onshore transmission line operators must develop a remedial action plan and apply for any necessary permits within 6 months of completing the inspection or testing that identified the deficiency. Remedial action must be completed promptly, but no later than the earliest of the following (§192.465(d)).~~

~~(i) Prior to the next inspection or test interval required by this section.~~

~~(ii) Within one year, not to exceed 15 months of the inspection or test that identified the deficiency; or as soon as practicable.~~

~~(iii) Not to exceed 6 months, after obtaining any necessary permits.~~

(e) Onshore transmission line operators must determine the extent of the area with inadequate cathodic protection where any annual pipe-to-soil measurement indicates cathodic protection levels below required levels of Appendix D (§192.465(f)). Operators should develop procedures to address systemic and non-systemic deficiencies per the requirements.

Transmission Example: A transmission line corrosion control system is unable to achieve the desired CP level.

(1) Investigate and determine the extent of the deficient area and whether it is systemic or non-systemic.

(i) Examples of systemic causes may include: extensive disbonded coating, rocky soil conditions resulting in shielding, interference with foreign impressed current systems.

(ii) Examples of non-systemic or location-specific causes may include: coating damage due to excavation, directional boring, or improper backfilling, current drains due to contact with foreign structure.

(2) If either systemic or non-systemic, remediate in accordance with ~~per~~ the above guide material and the distribution example.

(3) If systemic and practical, conduct close interval survey (§192.465(f)(2)), remediate (§192.465(d)), and confirm the restoration of adequate cathodic protection following external corrosion remedial actions (§192.465(f)(2)).

Examples of impractical conditions for close interval survey may include the following.

(i) Interruption that includes synchronizing with foreign impressed current systems.

(ii) Crossing paved roadways ~~interstates~~ or other hard surface areas ~~with safety limitations~~.

(iii) Railroad crossings.

(iv) Water body crossings.

(v) Steep terrain.

(vi) Rocky terrain.

(vii) Deep pipeline installations.

(viii) Cased pipelines.

(~~e~~ f) If remedial action on distribution lines cannot be completed prior to the next scheduled monitoring cycle, the operator should document the actions taken or planned to be taken to correct the deficiency and the expected timeframe for completion. ~~Onshore transmission line operators must meet requirements of §192.465(d).~~

(g) Onshore transmission line operators must meet requirements of §192.465(d).

4 METHODS FOR LOCATING CORROSION AREAS ON UNPROTECTED PIPELINES …

5 DETERMINING ACTIVE CORROSION ON UNPROTECTED PIPELINES …

6 "NOT ACTIVE" CONTINUING CORROSION ON UNPROTECTED PIPELINES …

7 CORRECTING ACTIVE CORROSION ON UNPROTECTED PIPELINES

7.1 Corrective measures. ...

7.2 Prompt action.

(a) Operators should take prompt action when an area of active corrosion is found. Corrective action should be completed within 15 months of discovery, or earlier if analysis indicates a shorter interval is appropriate.

(b) If corrective action on a distribution line cannot be completed within 15 months, the operator should document the actions taken and the expected timeframe for completion.

(c) Transmission line operators must meet requirements of §192.465(d).

7.3 Reference. ...

8 MONITORING OF CATHODICALLY PROTECTED AREAS ON UNPROTECTED PIPELINES ...

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