Description

This procedure outlines the requirements for electrical isolation of buried or submerged pipeline facilities.

Regulatory Applicability

All regulated buried or submerged gas pipelines that are not electrically interconnected and cathodically protected as a single unit with other underground structures.

☒ Regulated Transmission Pipelines
☒ Regulated Gathering Pipelines (Type A)
☒ Regulated Gathering Pipelines (Type B)
☒ Regulated Distribution Pipelines

Frequency

After pipe repairs, at installation, when a new crossing is conducted, or anytime there is a suspect that there may be interference with the cathodic protection system. Testing must also be performed to ensure that the isolation is adequate.

Reference

49 CFR 192.467 *External Corrosion Control: Electrical Isolation*
LA Title 43 Part XIII 2119 *External Corrosion Control: Electrical Isolation*

Forms / Record Retention

None

Related Specifications

None

OQ Covered Task

0071	Inspect or Test Cathodic Protection Electrical isolation Devices
0081	Install Cathodic Protection Electrical Isolation Devices
0091	*Troubleshoot In-service Cathodic Protection System*

(In order to perform the tasks listed above; personnel must be qualified in accordance with West Texas Gas's Operator Qualification program or directly supervised by a qualified individual.)

Procedure Steps

Standard Electrical Isolation Method

1. Flange Insulation

   Standard raised-face flanges may be made an insulating device by installing an insulating kit in the flange. An insulating kit consists of an electrically non-conductive gasket, non-conductive sleeves to encase the studs, and non-conductive washers for both nuts of a stud. Steel washers should also be placed immediately under nuts to protect the insulating washer from being crushed during torquing. Where applicable, equipment grounding shall be verified or implemented.

   When welding the insulating flange unit or the weld type insulated coupling into the line, care shall be exercised to be sure that the insulation is not damaged by the current "arc" that could occur from welding. This can be achieved by moving the ground cable to the same side of the flange set as the electrode cable thus eliminating current "arc" across the insulating flange during welding.

2. Monoblock Insulating Joints

   Monoblock insulating joints are factory-assembled insulating assemblies that are welded into a pipeline; they have no serviceable parts.

3. Insulated Unions

   Insulating unions are usually used for small-diameter (3 inches or less) piping attachments that require electrical insulation.

4. Casing Centralizers and End Seals

   Non-conductive centralizing devices are attached to pipelines where the carrier pipe passes through a cased crossing. These centralizers prevent electrical contact between the casing and the carrier pipe. Casing end seals prevent water or soil from entering the annular space between the carrier pipe and casing and causing an "electrolytic" short between the casing and pipe.

5. Other Devices

   Frequently, high-pressure laminated (e.g., micarta) dielectric blocks or neoprene rubber pads are used to electrically isolate a pipeline from supports or other structural appurtenances that are not a part of the cathodically protected pipeline.

Cased Crossings

Whenever possible, casing installations should be avoided. In some cases, however, railroad or public highway regulations required the installation of a casing for railway right-of-way or road crossings. When casings are required, the carrier pipe must be electrically isolated from the casing.

Electrical Isolation from a Foreign Pipeline Crossing

The pipeline can be tested for corrosion by conducting several pipe-to-soil potential readings either side of the crossing point. Adequate potential levels indicate isolation from the foreign pipeline. Adequate potential levels indicate isolation from the foreign pipeline.

If the potential levels are low in the area of foreign pipeline crossings, inadequate levels of isolation are indicated. This can be corrected by:

1. Installing anodes on our pipeline in this area until potential levels are adequate
2. Excavating the area and coating our pipeline with a suitable coating that achieves isolation
3. Excavating the area of crossing and physically separate the two pipelines until isolation is achieved.
4. Bonding the two pipelines together with resistance bonds to achieve protection from interference.

Where a pipeline is located in close proximity to electrical transmission tower footings, ground cables or other areas containing fault currents, protection must be provided by:

1. Kirk Cells
2. Current diodes
3. Fault interrupters

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