Description

This procedure gives the steps required to apply and repair external coating.

Regulatory Applicability

All DOT pipelines that are constructed, relocated, modified, replaced, including short segments replaced, will be coated. Pipelines that are converted to Part 192 service under 192.14 will be coated if relocated, replaced or substantially altered.

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

Frequency

As needed when a new pipeline is constructed or an existing pipeline is relocated, replaced or otherwise changed. This procedure may also be used after the pipeline coating has been damaged or a piece of pipe has been replaced. This should be done just prior to lowering the pipe into the ditch or submerging the pipe.

Reference

49 CFR 192.461 *External Corrosion Control: Protective Coating*
LA Title 43 Part XIII 2113 *External Corrosion Control: Protective Coating*

Forms / Record Retention

Document coating type with pipeline specifications

Related Specifications

None

OQ Covered Task

0991 Coating Application and Repair: Brushed or Rolled
1001 Coating Application and Repair: Sprayed
1011 External Coating Application and Repair – Wrapped
1021 Apply or Repair Internal Coating Other Than by Brushing, Rolling or Spraying

(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

Steel pipe that is to be buried must be coated to protect against corrosion. Weld joints, damaged areas, short sections of pipe, and buried fittings will have to be coated in the field.

1. Identify section to be coated.
2. Identify existing coating type, if previously coated.
3. Determine type of coating to be applied. Coating must:
   a) Be designed to mitigate corrosion of the buried or submerged pipe and components;
   b) Have sufficient adhesion to the metal surface to prevent under film migration of moisture;
   c) Be sufficiently ductile to resist cracking;
   d) Have enough strength to resist damage due handling and soil stress;
   e) Support any supplemental cathodic protection; and
   f) If the coating is an insulating type, have low moisture absorption and provide high electrical resistance.
   g) Must be inspected just prior to lowering the pipe into the ditch and backfilling. Any damage detrimental to effective corrosion control must be repaired.
4. Obtain the necessary tools, materials, and safety equipment.
5. If pipeline was previously coated, remove damaged coating on existing pipe.
6. Prepare surface for coating application according to coating manufacturer's specification.
7. Examine the pipe for evidence of corrosion, pitting, gouges, dents or other surface damage prior to applying coating.
8. Does the pipe surface have any of these damages that require further investigation?
   a) No: Continue with Step #9
   b) Yes: Seek assistance from appropriate personnel for additional investigation and corrective actions before applying coating.
9. Apply coating according to vendor/manufacturer specifications.
10. When applying the wrap:
    a) Pipe wrap tape and primer must be from the same manufacturer and approved for use with each other. Coating wrap should be minimum thickness of 35 mils.
    b) The wrap must have sufficient adhesion to the material surface to effectively resist under film migration of moisture. It must be sufficiently ductile to resist cracking and have sufficient strength to resist damage due to handling and soil stress.
    c) Coat the exposed steel with sufficient primer making sure to leave no voids in coverage. Primer must extend beyond tape one inch.

d) Let dry until tacky.

e) Tape wrap should extend no less than six inches onto existing coating on either side of weld area, repair, or replacement.

f) Wrap uphill, 50% overlap with no wrinkles.

Fusion Bond Epoxy Coatings:

Fusion Bond Epoxy coatings may be used for field joints, tie-ins, below ground fabrications, bore joint coating, and rehabilitation of existing pipelines. These products may be applied manually using brushes, rollers or by spraying using approved equipment. Strict manufacturer's instructions shall be followed pertaining to cleaning of materials to be coated, mixing and application of the product, regulating and inspecting the thickness of the application, and cure times due to changing conditions. Project inspectors will make sure that all equipment used in this process meets manufacturer's guidelines and all contract personnel and company personnel have the proper equipment and training to check material thickness either before curing (wet test) or after the material is cured (dry test).

Petrolatum Tape Installation:

Installation of petrolatum products should be limited to odd shaped buried pipeline components such as valves, flanges, service tee connections, and other applications that could be subject to voids in the coverage that would allow water or other impurities to collect on the pipe or component surface. When using these products strict attention shall be paid to manufacturer's instructions.

Roskoat/Mastic Coatings:

Roskoat/Mastic type coatings may be used for coating on exposed pipelines where repairs have been made to existing facilities. This type of coating should never be used on new construction, or on typical girth welds, and should be reserved for applications where wrapping the piping or components is not an option. All piping to be coated should be cleaned to bare metal with scrapers and power tools until all soil, rust, scale, and oil are removed. Care should be taken that all surfaces are coated with an even layer of material and allowed to dry and cure before backfilling.

Roskoat/Mastic coatings can be very damaging to plastic products and should never be allowed to accidently come into contact with plastic piping as it can cause failures.

Coating Testing

All lengths of pipe shall be inspected for holidays in the coating prior to installation in the field as the pipe is lowered into the ditch. This may be accomplished by jeeping the pipe at the job site.

1. Equipment

   Coating inspection shall be made with an approved (pulse type) holiday detector (jeep) having a voltage range of 1,000 - 14,000 volts.

2. Inspection Voltage

   Required test voltages for various fusion-bonded coating thicknesses and for coal tar coating are as illustrated in the table below.

   a) Improper high voltage may damage the pipe coating.

   b) Improper low voltage settings will not provide valid testing.

Required Test Voltages For FUSION-BONDED Coating Thicknesses			
Coating Thickness (Mils)	**Test Voltage**	**Coating Thickness (Mils)**	**Test Voltage**
10	1,600	15	2,000
11	1,800	16	2,000
12	1,800	20	2,250
13	1,800	25	2,500
14	2,000	30	3,000
Required Test Voltage For COAL TAR Coating			
93.75	12,000	-	-

3. Equipment Check
   a) Test the energy source (battery) for proper voltage output. Refer to manufacturer's instructions.
   b) Connect the exploring electrode and grounding cable to the terminal of the detectors.
   c) Switch the detector to the “On” position.
   d) Touch the exploring electrode to the ground cable alligator clip. The instrument signal should actuate in accordance with the instrument manufacturer's operating instructions.
   e) If the instrument signal actuates, the instrument is ready to be calibrated. If it does not actuate, consider it defective and contact the manufacturer for repair.
   f) Full-circle wire-type spring electrodes shall be used for testing pipe sizes 3 inch and larger.
   g) Full-circle or half-circle wire-type spring electrodes may be used on 2-inch diameter pipe.
   h) Brush-type electrodes made of conductive rubber or half-circle spring electrodes shall be used for testing pipe 1 inch and 1 1/4 inch in diameter.
4. Equipment Calibration
   a) The detector shall be calibrated to the specified voltage to be used before each initial daily use. It shall be recalibrated periodically during the day.
   b) Connect a high-voltage voltmeter between the probe and ground lead.
   c) Switch the detector to the “On” position.
   d) Compare the voltage of the voltmeter with the output voltage of the detector.

e) Switch the detector to the "Off" position and adjust to the specified voltage, if necessary.

CAUTION: Detector shall be in the "Off" position before making any changes in the voltage setting or connecting or disconnecting the voltmeter leads.

f) Switch the detector to the "On" position.

g) Again, compare the voltage of the voltmeter with the output voltage of the detector.

h) Switch the detector to the "Off" position and disconnect the voltmeter.

i) The instrument is now ready for use.

5. Testing Procedure

a) The pipe to be inspected shall be grounded from the bare end of the pipe to the earth. When individual joints of pipe are being tested, each joint shall be individually grounded.

b) If moisture exists on the coating surface, it shall either be removed or the surface shall be allowed to dry prior to conducting the test. Moisture on the coating surface can cause erroneous indications.

c) Make contact with the detector electrode on the bare pipe end to verify that the instrument is properly grounded. This test shall be done each time a new section of coated piping is tested.

d) For applications requiring a spring-type electrode, use a single pass, moving the electrode over the surface of the dry coating at a rate of approximately 1 foot per second.

e) For applications requiring a brush-type or half-circle electrode, a pass on each side of the pipe 180^0 apart is required.

f) As defects are identified, mark the location so repairs can be made upon completion of jeeping and prior to installation.

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