



## PIPELINE CORROSION CONTROL

### Competencies / Objectives

## Level One

### MODULE 66101-02 – INTRODUCTION TO THE PIPELINE INDUSTRY

1. Explain the basic functions and purposes of pipelines and facilities and identify the characteristics and hazards of common pipeline products.
2. Identify maps and drawings used to depict pipelines and facilities.
3. Explain the roles of control personnel and equipment in the overall operation of a pipeline.
4. Explain liquid pipeline hydraulics and gas pipeline pneumatics.
5. Explain the types and purposes of pipeline equipment.
6. Explain pipeline electrical power systems and corrosion control.
7. Review operations, maintenance, and emergency procedures and perform documentation required for pipeline operations.

### MODULE 66102-02 – LIQUID PIPELINE GENERAL ABNORMAL OPERATING CONDITIONS

1. Recognize and react to abnormal facility conditions.
2. Recognize and react to activation of a safety device.
3. Recognize and react to communications failures.
4. Recognize and react to power interruptions.
5. Respond appropriately to fire, explosions, and natural disasters.
6. Recognize and react to pipeline system damage.
7. Recognize and react to unexpected hazardous liquid or carbon dioxide (CO<sub>2</sub>) leaks.
8. Recognize and react to unexplained pressure deviations.

### MODULE 61103-02 – LOCATING PIPELINE AND CABLE (CT 14.1 AND 17.1)

1. Explain the One-Call notification system.
2. Identify and explain the types of pipe and cable found underground.
3. Identify and explain the types of equipment used to locate underground pipe and cable (CT 14.1 and 17.1).
4. Perform approved procedures to accurately locate underground pipe and cable (CT 14.1 and 17.1).

### MODULE 61104-02 – MEASURE PIT DEPTH AND WALL THICKNESS (CT 8.1, 8.2, AND 8.3)

1. Using a pit gauge, measure pitting or other metal loss features to pipeline structures and identify conditions requiring corrective action (CT 8.1).
2. Use a D-Scan Ultrasonic Thickness (UT) Meter to accurately collect and record nominal wall thickness readings on a pipeline or other coated structure (CT 8.2).
3. Obtain accurate measurements of localized corrosion to be used for calculating remaining pipe strength per B31G or RSTRENG (CT 8.3).

## **MODULE 61105-02 – INSPECT BURIED AND SUBMERGED PIPE WHEN EXPOSED (CT 5.1, 5.2, AND 5.3)**

1. Perform inspection of the pipe and coating for evidence of damage and/or abnormalities (CT 5.1).
2. Examine exposed pipe to identify any areas of corrosion (CT 5.2).
3. Perform inspection of the pipe coating, noting its condition whenever the pipe is exposed (CT 5.3).
4. Document the location of corrosion and damage to a buried pipeline.

## **MODULE 61106-02 – ABOVEGROUND PIPE COATING AND INSPECTION (CT 7.1, 7.2, 7.3, 7.5, 13.1, AND 13.2)**

1. Describe the requirements for surface preparation for aboveground pipe (CT 7.1 and 7.2).
2. Prepare/clean surface for atmospheric coating using hand and power tools (CT 7.2, 7.3, 7.5, 13.1, and 13.2).
3. Visually inspect the quality of the surface preparation (CT 7.2, 7.3, and 13.2).
4. Inspect the quality of the surface preparation by checking the surface profile (CT 7.2).
5. Properly select a coating to be used.
6. Properly apply a coating to aboveground pipe (CT 7.5).

## **MODULE 61107-02 – APPLY/REPAIR EXTERNAL COATINGS ON BURIED/SUBMERGED PIPE (CT 13.4)**

1. Select a coating for buried or submerged piping.
2. Remove coating from buried or submerged pipe using chemical strippers or blasting systems. (CT 13.4).
3. Apply coatings with a brush and roller.
4. Apply coatings with a conventional spray system.

## **MODULE 61108-02 – CATHODIC PROTECTION MEASUREMENT (CT 1.1, 1.5, 3.1, AND 3.2)**

1. Explain the basic theory of cathodic protection (CP).
2. Define galvanic and impressed current CP and explain the advantages and limitations of each system.
3. Demonstrate how to use instrumentation and meters to monitor CP systems (CT 1.1).
4. Measure structure-to-soil potentials (CT 1.1).
5. Inspect and perform electrical tests of bonds.
6. Obtain voltage and current output readings from a rectifier (CT 3.1).
7. Check proper operation of a rectifier (CT 3.2).
8. Interpret and test isolation devices (CT 1.5).

## **MODULE 61109-02 – TEST STATION REPAIR (CT 2.1, 2.2, 2.3, AND 2.4)**

1. Identify test lead damage (CT 2.1 and 2.2).
2. Repair a test lead and verify that the repair was performed effectively (CT 2.2).
3. Install test leads by non-exothermic welding methods (CT 2.3).
4. Install test leads by exothermic welding methods (CT 2.4).

## **MODULE 61110-02 – INSPECT INTERNAL PIPE SURFACES (CT 12)**

1. Properly orient the pipe to be removed by identifying the top, bottom, left side, right side, upstream direction, and downstream direction (CT 12).
2. Recognize internal corrosion (CT 12).
3. Properly operate wall thickness and pit depth measurement equipment (CT 12).

## **MODULE 61111-02 – INTERNAL CORROSION CONTROL (CT 10.1, 10.2, AND 11)**

1. Safely insert and retract corrosion coupons and document vital information (CT 10.1).
2. Accurately record readings of probes with corrosion measurement tools (CT 10.2).
3. Adjust inhibitor injection rates to achieve an acceptable company standard (CT 11).

## Level Two

### **MODULE 61201-02 – INSTALL CATHODIC PROTECTION SYSTEMS (CT 9.2, 9.3, AND 9.4)**

1. Describe the information that must be gathered when planning a cathodic protection system.
2. Explain how to select the system components.
3. Describe installation techniques for galvanic and impressed current systems (CT 9.2 and 9.4).
4. Perform rectifier installation (CT 9.3).

### **MODULE 61202-02 – MAINTAIN AND REPAIR RECTIFIERS (CT 4)**

1. Describe the characteristics of cathodic protection rectifiers.
2. Describe the functions of typical rectifier components.
3. Describe troubleshooting techniques for rectifier and bond connections (CT 4.1).
4. Describe the common repair process for a rectifier (CT 4.2).
5. Describe the adjustment procedures for a rectifier (CT 4.3).

### **MODULE 61203-02 – MITIGATE INTERFERENCE (CT 1.3 AND 9.1)**

1. Identify the sources of interference current in a cathodic protection system (CT 1.3).
2. Describe the techniques used to test for mitigation in a cathodic protection system (CT 9.1).

### **MODULE 61204-02 – TEST AND REPAIR SHORTED CASINGS (CT 9.5)**

1. Identify causes of shorted casings.
2. Identify a shorted casing.
3. Test for shorted casings.
4. Identify methods for repairing shorted casings.
5. Describe the use of insulated fittings.

### **MODULE 61205-02 – CONDUCT CLOSE INTERVAL SURVEY (CT 1.2 AND 1.4)**

1. Identify common close interval survey equipment (CT 1.2).
2. Describe the common methods to perform a close interval survey (CT 1.2).
3. Describe the major steps in performing a close interval survey (CT 1.2).
4. Describe inspecting and testing bonds and protective devices (CT 1.4).

### **MODULE 61206-02 – PERFORM COATING INSPECTION (CT 7.7)**

1. Describe the required pre-inspection activities.
2. Perform quality inspections (CT 7.7).
3. Identify and explain causes of coating failures (CT 7.7).

### **MODULE 61207-02 – PERFORM HIGH-PRESSURE BLASTING/SURFACE PREPARATION (CT 7.4 AND 13.3)**

1. Identify and explain basic abrasive blast system equipment.
2. Effectively and safely operate basic abrasive blast system equipment (CT 7.4 and CT 13.3).
3. Describe the characteristics of blast cleaning media (CT 7.4 and CT 13.3).
4. Explain preparation standards, profiling, and inspection techniques (CT 7.4 and CT 13.3).
5. Prepare the surface according to manufacturer's specifications and in accordance to company safety and environmental guidelines (CT 7.4 and CT 13.3).

## **MODULE 61208-02 – APPLY COATINGS USING SPRAY APPLICATIONS (CT 7.6 AND 13.5)**

1. Identify and explain different coating types (CT 13.5).
2. Determine whether or not the coating is compatible with environmental conditions, the substrate to be coated, any related job-site conditions, or any other requirements of the job (CT 7.6)
3. Prepare the surface for coating application according to manufacturer specification (CT 7.6 and CT 13.5).
4. Identify and explain the different spray application systems used for coating.
5. Apply coating according to manufacturer specifications (CT 7.6 and CT 13.5).



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## **PIPELINE CORROSION CONTROL**

### **Materials and Equipment**

## **Level One**

### **MODULE 66101-02 - INTRODUCTION TO THE PIPELINE INDUSTRY**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Copies of Quick Quiz  
Module Examinations  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Samples of P&IDs, blueprints, and strip maps/alignment sheets  
Posterboard or other large sheets of paper  
Colored markers  
Assorted valves  
Copies of API 650 and API 653  
Copies of API 510 and 2510  
Assorted fittings  
Copies of 49 CFR Part 192 (Gas) and/or 49 CFR Part 195 (Liquid), including Parts 192.327 and 195.248  
Assorted corrosion coupons  
Various examples of documentation, including:  
Operations logs  
Work orders  
Event logs

## **MODULE 66102-02 - LIQUID PIPELINE GENERAL ABNORMAL OPERATING CONDITIONS**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of your local code  
Photos of damaged pipeline supports or other pipeline components  
Copies of a sample Safety-Related Condition Report Form  
Copies of the Code of Federal Regulations, Title 49, Part 195

## **MODULE 61103-02 - LOCATING PIPELINE AND CABLE(CT 14.1 AND 17.1)**

Whiteboard/chalkboard  
Markers/chalk  
Overhead projector and screen  
Transparencies  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Copies of a pipeline strip map  
Copies of a pipeline alignment sheet  
Ferromagnetic locators  
Stick metal detectors, split box locators, flag markers  
Copies of 49 CFR 195.250 and 192.325  
Copies of the Performance Verifications for Covered Tasks 14.1 and 17.1  
Module Examinations  
Performance Profile Sheets

## **MODULE 61104-02 - MEASURE PIT DEPTH AND WALL THICKNESS (CT 8.1, 8.2, AND 8.3)**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of your company's policies and procedures manual  
Copies of 49 CFR Part 195 (Liquid) and 49 CFR 192 (Gas)  
Copies of Performance Verifications for Covered Tasks 8.1, 8.2, 8.3  
Mechanical and dial pit gauges, some with worn points  
Sections of pitted pipe, corroded, and coated or uncoated pipe  
Dial pit gauges with manufacturer's instruction  
Mechanical pit gauges with manufacturer's instruction  
Ultrasonic meters with operating manuals  
Velocity of sound charts  
Couplants  
Graph paper  
Carbon paper  
Lumber pencils  
Pipeline inspection report forms  
Pipe cleaning materials



## **MODULE 61105-02 - INSPECT BURIED AND SUBMERGED PIPE WHEN EXPOSED (CT 5.1, 5.2, AND 5.3)**

Overhead projector and screen  
Transparencies  
Blank acetate sheets  
Transparency pens  
Whiteboard/chalkboard  
Markers/chalk  
Appropriate personal protective equipment  
Pencils and scratch paper  
Copies of your local code  
Section of pipe with alligatored coal tar coating  
Access to a buried pipeline and necessary exterior inspection equipment  
Access to an opened, buried pipeline and necessary interior inspection equipment  
Mechanical pit gauges, dial pit gauges, and micrometer pit gauges  
Sections of pitted pipe  
Equipment needed to inspect a buried pipe for physical damage and external corrosion  
Equipment needed to inspect the condition of external coatings on buried or submerged pipe  
Module Examinations  
Performance Profile Sheets  
Copies of Quick Quiz  
Copies of the Performance Verifications associated with this module (5.1, 5.2, and 5.3)

## **MODULE 61106-02 - ABOVEGROUND PIPE COATING AND INSPECTION (CT 7.1, 7.2, 7.3, 7.5, 13.1, AND 13.2)**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Copies of Performance Verifications for Covered Tasks 7 and 13  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of 49 CFR Part 192 (Gas) and/or 49 CFR Part 195 (Liquid)  
Copies of your company policy and procedures manual  
Copies of Figure 4 with the callouts covered  
Spray equipment with a wand assembly safety latch  
Protective clothing  
Gloves  
Helmet with screen visor  
Goggles  
A variety of pressure washing nozzles, tips, and accessories, including:  
    0-, 15-, 25-, and 40-degree tips  
    Power scrub brushes  
    Telescoping extensions  
    Horizontal scrubbers  
    Rotating water blast nozzles  
    Variable tip nozzles  
    Rotatable tip nozzles  
    Wet abrasive injectors  
A variety of common hand tools, including:  
    Abrasive pads  
    Scrapers  
    Putty knives  
    Wire brushes  
    Chipping hammers  
    Surfaces that require cleaning  
A variety of power tools, including:  
    Grinders  
    Sanders  
    Power files  
    Needle guns  
    Rotary impact power tools  
    Vacuum shrouds

**MODULE 61106-02 - ABOVEGROUND PIPE COATING AND INSPECTION  
(CT 7.1, 7.2, 7.3, 7.5, 13.1, AND 13.2) Continued**

Inspection tools, including:

- Profile comparators

- Profile gauges

- Replica tape

- Practice surfaces for preparation and inspection

- Sling psychrometers

- Electric hydrometers

- Surface thermometers

Sample shapes and styles of brushes of various quality

A variety of brushes and rollers

Coatings

Cleaned surfaces for applying coatings

Materials to clean the brushes and roller covers

Roller covers

Brush comb or wire brush

Rags

Brush spinner

Roller spinner

Combination tool

## **MODULE 61107-02 - APPLY AND REPAIR EXTERNAL COATINGS ON BURIED AND SUBMERGED PIPE (CT 13.4)**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Copies of Quick Quiz  
Copies of Performance Verifications for Covered Task 13  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of 49 CFR Part 192 (Gas) and/or 49 CFR Part 195 (Liquid)  
Copies of your company policy and procedures manual  
Manufacturers' product information data sheets for coating  
SSPC-VIS 1 photographs that illustrate each grade of steel cleanliness  
A variety of steel surface samples  
A variety of surface profiling instruments, including:  
    Profile comparator  
    Profile gauge  
    Replica tape  
A variety of brushes  
Containers filled with coating  
Practice surfaces for applying coating with a brush  
A variety of rollers  
Trays filled with coating  
Practice surfaces for applying coating with a roller  
A variety of practice surfaces  
Conventional and airless spray systems  
Coatings  
Respirators

## **MODULE 61108-02 - CATHODIC PROTECTION MEASUREMENT (CT 1.1, 1.5, 3.1, AND 3.2)**

Overhead projector and screen  
Transparencies  
Blank acetate sheets  
Whiteboard/chalkboard  
Transparency pens  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Copies of 49 CFR 192 and 195  
Copies of API 650-653  
Test equipment for measuring structure-to-soil electrolyte potential  
Forms for recording soil potential  
Digital voltmeter  
Forms for recording rectifier readings  
Ammeters  
Access to a rectifier with and without a meter installed and with and without a shunt  
Copies of NACE Standard RP-01-69  
Samples of piping with various coating defects  
Several types of voltmeters with various features  
Ammeters, various types of shunts, and access to measurable circuits  
Soil resistance meters, soil resistance pins, selector boxes, and soil boxes  
Variety of copper sulfate electrodes  
Multimeters and audio and visual continuity testers  
Multimeters with damaged and undamaged test leads, probes, and plugs  
Nonmetallic abrasive pads, distilled water, and copper sulfate crystals  
Insulation materials and access to existing flanges that need to be insulated  
Access to functioning and defective insulated flanges and appropriate measuring equipment  
Isolation surge protectors and polarization cells  
Module Examinations  
Performance Profile Sheets  
Copies of the Performance Verifications for Covered Tasks 1.1, 1.5, 3.1, and 3.2

## **MODULE 61109-02 - TEST STATION REPAIR (CT 2.1, 2.2, 2.3, AND 2.4)**

Overhead projector and screen  
Transparencies  
Blank acetate sheets  
Transparency pens  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Copies of 49 CFR 192.469  
Copper wire, soldering iron, sponge, water, tinning paste, solder  
Appropriate splicing equipment and materials  
Appropriate equipment and materials for metallurgical bonding  
Appropriate equipment and materials for the four types of mechanical bonding  
Multimeters or continuity testers  
Copies of sample company and OSHA procedures regarding exposing underground pipeline  
Segments or photos of damaged pipe  
Module Examinations  
Performance Profile Sheets  
Copies of the Performance Verifications for Covered Tasks 2.1, 2.2, 2.3, and 2.4

## **MODULE 61110-02 - INSPECT INTERNAL PIPE SURFACES (CT 12)**

Overhead projector and screen  
Transparencies  
Blank acetate sheets  
Transparency pens  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Compasses  
Pipeline inspection documents, two sets  
Compasses, pit gauges, pocket knives, and plastic for wrapping the samples  
Field corrosion report forms  
Examples of coating failures  
Corroded pipe sections  
Company forms for recording pit length and depth measurements  
Ultrasonic thickness gauges and calibration standards  
Pipeline inspection forms  
Access to pipeline that needs to be inspected and related equipment  
Solvent or mechanical means of removing hydrocarbon residue  
Copies of Quick Quiz  
Module Examinations  
Performance Profile Sheets  
Copies of the Performance Verification for Covered Task 12

## **MODULE 61111-02 - INTERNAL CORROSION CONTROL (CT 10.1, 10.2, AND 11)**

Transparencies

Markers/chalk

Blank acetate sheets

Transparency pens

Pencils and scratch paper

Module Examinations

Performance Profile Sheets

Overhead projector and screen

Copies of Performance Verifications for Covered Tasks 10.1, 10.2, and 11

Copies of 49 CFR Part 195 (Liquid) and 49 CFR 192 (Gas)

Whiteboard/chalkboard

Appropriate personal protective equipment

Copies of your company's policies and procedures manual

Equipment and tools necessary for monitoring and adjusting chemical injection systems

Equipment and tools necessary for inserting and retracting coupon holders

A variety of probes, manufacturers' instructions, and company forms

## Level Two

### MODULE 61201-02 - INSTALL CATHODIC PROTECTION SYSTEMS (CT 9.2, 9.3, AND 9.4)

Overhead projector and screen  
Transparencies  
Felt-tip markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Copies of Performance Verifications for Covered Task 9  
Copies of Quick Quiz†  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of 49 CFR Part 192 (Gas) and/or 49 CFR Part 195 (Liquid)  
Copies of your company policy and procedures manual  
Magnesium anodes  
Knives suitable for cutting magnesium anodes  
Ribbon (strip) anodes  
Vertical anodes  
Horizontal anodes  
Header cables  
Practice anodes  
Lead wires  
Junction boxes  
Tools to connect anodes  
Tools to splice header cables to the anode lead wires  
Rectifiers  
AC power feed wires  
Conduit  
Tools to connect the specified conduits to the rectifier  
Header cables  
Single thermite weld  
Tools to separate the cable strands and connect them to a junction box  
Manufacturer's instructions and wiring diagrams



## MODULE 61202-02 - MAINTAIN AND REPAIR RECTIFIERS (CT 4)

Overhead projector and screen

Transparencies

Felt-tip markers/chalk

Blank acetate sheets

Transparency pens

Pencils and scratch paper

Module Examinations

Performance Profile Sheets

Copies of Performance Verifications for Covered Task 4

Whiteboard/chalkboard

Appropriate personal protective equipment

Copies of 49 CFR Part 192 (Gas) and/or 49 CFR Part 195 (Liquid)

Copies of your company policy and procedures manual

Rectifying cells

Bridge circuits

Rectifiers

A variety of meters, including the following

- d'Arsonval meters

- Voltmeters

- Ammeters

- Volt-ammeters

- Digital meters

Tools to connect meters to rectifiers

Copies of Figure 1 with the callouts covered

Several ohmmeters

Test leads

Tools to connect leads

Fuses

Rectifier components, including

Meters

AC breakers

AC fuses

Transformers

Stacks

Three-phase circuits

Tools to test three-phase circuits

Tools to adjust the fine tap settings

Electronic control cards

## **MODULE 61203-02 - MITIGATE INTERFERENCE (CT 1.3 AND 9.1)**

Overhead projector and screen

Whiteboard/chalkboard

Transparencies

Markers/chalk

Blank acetate sheets

Transparency pens

Pencils and scratch paper

Module Examinations\*

Performance Profile Sheets

Copies of Performance Verifications for Covered Tasks 1 and 9

Appropriate personal protective equipment

Copies of 49 CFR Part 192 (Gas) and/or 49 CFR Part 195 (Liquid)

Copies of your company policy and procedures manual

Automatic current interrupter

Sample field data sheets

Recording survey notes

Voltmeter

Shunts

Test wires

Test boxes

Tools to attach and terminate test wires

Tools to install shunts inside test boxes

Sample strip maps

## **MODULE 61204-02 - TEST AND REPAIR SHORTED CASINGS (CT 9.5)**

- Overhead projector and screen
- Whiteboard/chalkboard
- Transparencies
- Markers/chalk
- Blank acetate sheets
- Transparency pens
- Pencils and scratch paper
- Module Examinations
- Performance Profile Sheets
- Copies of Performance Verifications for Covered Task 9
- Appropriate personal protective equipment
- Copies of 49 CFR Part 192 (Gas) and/or 49 CFR Part 195 (Liquid)
- Copies of your company policy and procedures manual
- Calculators
- Tools and materials to fill shorted casings, including the following
  - Casings
  - High dielectric materials
  - Casing end seals
  - Vents
- Materials to flush the casing annulus
- Casing insulators
- Center cradles
- Tools to install casing insulators and center cradles into a shorted casing
- Shorted casings
- Tools and materials to repair shorted casings

## **MODULE 61205-02 - CONDUCT CLOSE INTERVAL SURVEY (CT 1.2 AND 1.4)**

- Overhead projector and screen
- Whiteboard/chalkboard
- Transparencies
- Markers/chalk
- Blank acetate sheets
- Transparency pens
- Pencils and scratch paper
- Module Examinations
- Performance Profile Sheets
- Copies of the Performance Verifications for Covered Task 1
- Appropriate personal protective equipment
- Copies of your local code
- Wire reels
- Current interrupter
- Materials and equipment for selecting and maintaining survey test equipment, including manufacturer's operation manual
- Materials and equipment for performing a close interval survey
- Materials and equipment for inspecting and testing bonds and protective devices, including manufacturer's guidelines

## MODULE 61206-02 - PERFORM COATING INSPECTION (CT 7.7)

Overhead projector and screen  
Whiteboard/chalkboard  
Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Copies of the Performance Verifications for Covered Task 7  
Appropriate personal protective equipment  
Copies of your company's policies and procedures manual  
Sling-type and battery-operated psychrometers, water, and a psychrometric chart  
Electronic thermometer/hygrometer and manufacturer's calibration instructions  
Electronic and surface temperature thermometers  
Wind meter  
Materials for checking a compressed air supply  
Copy of SSPC-SP1 and SSPC-SP13  
Equipment and materials for measuring surface profile  
Equipment and materials for measuring coating viscosity, including Zahn cup  
Testing equipment for wet-film and destructive and nondestructive dry-film testing  
Coated materials  
Pencils of varying hardnesses  
Coated section of pipe  
Manufacturer's data sheets and application bulletins  
Blank or completed forms for quality control/assurance  
Examples of coating failures  
Necessary equipment for diagnosing coating failure, including manufacturer's data sheet/application bulletins

## **MODULE 61207-02 - PERFORM HIGH-PRESSURE BLASTING/SURFACE PREPARATION (CT 7.4 AND 13.3)**

Overhead projector and screen  
Whiteboard/chalkboard  
Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Copies of the Performance Verifications for Covered Tasks 7 and 13  
Appropriate personal protective equipment  
Copies of your company's policies and procedures manual  
Whip checks, hoses, couplings, and coupling gaskets  
Photo or drawing of a National Board label on a pressurized tank blast machine  
Samples of these types of abrasives: metallic, mineral, by-product, and special-purpose  
Copies of SSPC-VIS 1 photographs  
Profile comparator, profile gauge, and replica tape  
Materials and equipment necessary for blast system start-up, operation, and shutdown, including manufacturer's operation and instruction manual

## **MODULE 61208-02 - APPLY COATINGS USING SPRAY APPLICATIONS (CT 7.6 AND 13.5)**

Overhead projector and screen  
Whiteboard/chalkboard  
Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Copies of Quick Quiz  
Copies of the Performance Verifications for Covered Tasks 7 and 13  
Appropriate personal protective equipment  
Copies of your company's policies and procedures manual  
Sample manufacturer's coating system data sheets  
Respirator  
Necessary equipment and materials for spraying  
Necessary equipment and materials for cleaning and maintaining conventional spray equipment  
Necessary equipment and materials for using, cleaning, and maintaining HVLP spray equipment  
Samples of various types of spray coating problems  
Viscosity cup and coating material  
Wet-film thickness gauge, dry-film thickness gauge, and coated substrates



## PIPELINE CORROSION CONTROL

### Performance Tasks

## Level One

### MODULE 66101-02 – INTRODUCTION TO THE PIPELINE INDUSTRY

Task Number	Item	Date(s)	Recorded By
This is a knowledge-based module; there is no performance testing.			

### MODULE 66102-02 – LIQUID PIPELINE GENERAL ABNORMAL OPERATING CONDITIONS

Task Number	Item	Date(s)	Recorded By
This is a knowledge-based module; there is no performance testing.			

### MODULE 61103-02 – LOCATING PIPELINE AND CABLE (CT 14.1 AND 17.1)

Task Number	Item	Date(s)	Recorded By
61103-1	Locate line (CT 14.1 and 17.1).		

### MODULE 61104-02 – MEASURE PIT DEPTH AND WALL THICKNESS (CT 8.1, 8.2, AND 8.3)

Task Number	Item	Date(s)	Recorded By
61104-1	Accurately measure pit depth using a pit gauge (CT 8.1).		
61104-2	Properly measure a corroded area of pipe (CT 8.3).		
61104-3	Using a handheld ultrasonic meter, accurately measure wall thickness (CT 8.2).		

**MODULE 61105-02 – INSPECT BURIED AND SUBMERGED PIPE WHEN EXPOSED  
(CT 5.1, 5.2, AND 5.3)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
61105-1	Inspect for physical damage on buried or submerged pipe (CT 5.1).		
61105-2	Inspect for external corrosion on buried or submerged pipe (CT 5.2).		
61105-3	Inspect the condition of external coating on buried or submerged pipe (CT 5.3).		

**MODULE 61106-02 – ABOVEGROUND PIPE COATING AND INSPECTION  
(CT 7.1, 7.2, 7.3, 7.5, 13.1, AND 13.2)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
61106-1	Prepare a coating evaluation and prepare the surface of a pipeline system for coating application or repairs (CT 7.1, 7.2, 7.3, 7.5, 13.1, and 13.2).		
61106-2	Visually inspect and verify the quality of the surface preparation by checking the surface profile (CT 7.2).		
61106-3	Properly apply corrosion-preventative coating to a pipeline facility exposed to atmospheric conditions (CT 7.5).		

**MODULE 61107-02 – APPLY/REPAIR EXTERNAL COATINGS ON BURIED/SUBMERGED PIPE  
(CT 13.4)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
61107-1	Properly prepare and apply different types of coatings according to the manufacturer's instructions (CT 13.4).		

## MODULE 61108-02 – CATHODIC PROTECTION MEASUREMENT (CT 1.1, 1.5, 3.1, AND 3.2)

Task Number	Item	Date(s)	Recorded By
61108-1	Properly locate the reference electrode relative to the structure (CT 1.1).		
61108-2	Measure structure-to-soil potential (C 1.1).		
61108-3	Obtain a voltage and current output reading from a rectifier (CT 3.1).		
61108-4	Check for proper operation of a rectifier (CT 3.2). <ul style="list-style-type: none"><li>• Determine voltage.</li><li>• Determine current.</li><li>• Obtain the shunt ratio.</li><li>• Examine rectifier for abnormal defects.</li></ul>		
61108-5	Inspect and test isolation devices (CT 1.5).		

## MODULE 61109-02 – TEST STATION REPAIR (CT 2.1, 2.2, 2.3, AND 2.4)

Task Number	Item	Date(s)	Recorded By
61109-1	Install test leads by exothermic welding methods (CT 2.4).		
61109-2	Install test leads by non-exothermic welding methods (CT 2.3).		
61109-3	Inspect and verify test lead continuity (CT 2.1).		
61109-4	Repair damaged test leads (CT 2.2).		

## MODULE 61110-02 – INSPECT INTERNAL PIPE SURFACES (CT 12)

Task Number	Item	Date(s)	Recorded By
61110-1	Inspect internal pipe surface (CT 12).		

## MODULE 61111-02 – INTERNAL CORROSION CONTROL (CT 10.1, 10.2, AND 11)

Task Number	Item	Date(s)	Recorded By
61111-1	Insert and remove coupons according to manufacturer and company specifications (CT 10.1).		
61111-2	Properly monitor on-line probes (CT 10.2).		
61111-3	Perform internal corrosion remediation (CT 11).		



## Level Two

### MODULE 61201-02 – INSTALL CATHODIC PROTECTION SYSTEMS (CT 9.2, 9.3, AND 9.4)

Task Number	Item	Date(s)	Recorded By
61201-1	Correctly install galvanic anodes (CT 9.2, 9.4). <ul style="list-style-type: none"><li>• Install anode.</li><li>• Attach leads to structure and test station.</li></ul>		
61201-2	Install impressed current ground beds (CT 9.4).		
61201-3	Properly install rectifiers (CT 9.3). <ul style="list-style-type: none"><li>• Connect positive cable and negative header cables to proper output terminals.</li></ul>		

### MODULE 61202-02 – MAINTAIN AND REPAIR RECTIFIERS (CT 4)

Task Number	Item	Date(s)	Recorded By
61202-1	Troubleshoot rectifier bond connections (CT 4.1).		
61202-2	Properly repair and replace defective rectifier components (CT 4.2).		
61202-3	Correctly adjust rectifier components for proper output (CT 4.3).		

### MODULE 61203-02 – MITIGATE INTERFERENCE (CT 1.3 AND 9.1)

Task Number	Item	Date(s)	Recorded By
61203-1	Take structure-to-soil readings (CT 1.3).		
61203-2	Initiate proper remediation for readings that are outside of the desired range (CT 1.3).		
61203-3	Install bonds to mitigate DC interference (CT 9.1).		

### MODULE 61204-02 – TEST AND REPAIR SHORTED CASINGS (CT 9.5)

Task Number	Item	Date(s)	Recorded By
61204-1	Identify and properly repair shorted casings (CT 9.5).		

## **MODULE 61205-02 – CONDUCT CLOSE INTERVAL SURVEY (CT 1.2 AND 1.4)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
61205-1	Select the proper instrumentation, test leads, and reference electrode for a given close interval survey (CT 1.2).		
61205-2	Correctly perform a close interval survey (CT 1.2).		
61205-3	Visually inspect and perform electrical tests on bonds connecting multiple structures and isolating devices (CT 1.4).		

## **MODULE 61206-02 – PERFORMING COATING INSPECTION (CT 7.7)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
61206-1	Properly conduct pre-inspection activities.		
61206-2	Correctly conduct and record results from inspections performed using various inspection methods (CT 7.7).		

## **MODULE 61207-02 – PERFORM HIGH-PRESSURE BLASTING/SURFACE PREPARATION (CT 7.4 AND 13.3)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
61207-1	Prepare the surface in accordance with appropriate specifications and guidelines (CT 7.4 and 13.3).		
61207-2	Operate power-cleaning tools in a safe and effective manner (CT 7.4).		
61207-3	Visually inspect or repair defects (CT 13.3).		

## **MODULE 61208-02 – APPLY COATINGS USING SPRAY APPLICATIONS (CT 7.6 AND 13.5)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
61208-1	Identify the correct coating repair method/procedure for a given type of coating (CT 7.6).		
61208-2	Properly apply coating to a pipeline facility exposed to atmospheric conditions (CT 7.6 and 13.5).		
61208-3	Visually inspect or repair coating defects (CT 13.5).		