Pipeline Maintenance and Mechanical

Volume 1

Pipeline Mechanic Hand and Power Tools (10 Hours)
(Module ID 63103-02) Introduces hand and power tools used to maintain and install pipeline equipment. Discusses tool safety and procedures for selecting, inspecting, using, and maintaining the tools.

Piping and Mechanical Blueprint Reading (15 Hours)
(Module ID 63104-02) Explains how to read plot plans, P&IDs, piping isometric drawings, detail sheets, and machine drawings. Describes common components and symbols used in various drawings.

Tubing, Threaded Pipe, and Hoses (30 Hours)
(Module ID 63105-02) Introduces a variety of tubing, tubing materials, tools, and work practices used in the pipeline industry. Identifies the materials used in threaded piping systems. Describes the types and uses of screwed fittings.

Fasteners (10 Hours)
(Module ID 63106-02) Covers installation procedures for threaded, nonthreaded, and insulation fasteners used in the pipeline industry.

Introduction to Pumps (10 Hours)
(Module ID 63207-02) Identifies main-line and feeder line pumps including centrifugal, rotary, reciprocating, and metering pumps. Explains net positive suction head and cavitation. Outlines general procedures for pump installation.

Identification of Valve Actuators/Operators (15 Hours)
(Module ID 63208-02) Identifies types of manual, electric, hydraulic, and pneumatic valve actuators used in the pipeline industry. Covers storage and handling, installation, and preventive maintenance procedures for these actuators.

Installing Seals and Gaskets (10 Hours)
(Module ID 63109-02) Covers the applications, removal procedures, and installation procedures for dynamic and static seals and O-rings. Also identifies gaskets and gasket materials and explains the procedures for laying out, cutting, and installing gaskets.

Introduction to Pneumatic Systems (10 Hours)
(Module ID 63201-02) Discusses pneumatic system safety, characteristics of gases and how they are compressed, pneumatic transmission of energy, and compressor operation.

Introduction to Hydraulic Systems (10 Hours)
(Module ID 63202-02) Discusses hydraulic system safety and the basic principles of hydraulics, including Pascal's law and Bernoulli's principle. Explains the function of fluids, parts, pumps, and motors.

Installing and Maintaining Pipeline Equipment (7.5 Hours)
(Module ID 63107-02) Identifies types of valves used in the pipeline industry. Covers storage and handing, installation, and preventive maintenance for these valves.

Maintain and Repair Drivers (15 Hours)
(Module ID 63210-02) Identifies types of drivers that provide power to rotating equipment on pipelines. Explains how to inspect and replace drivers, replace bearings and seals, and perform preventive maintenance.

Install Rotating Equipment (25 Hours)
ISBN 978-0-13-038378-4
(Module ID 63301-02) Identifies inspection requirements for an equipment pod, requirements for equipment base preparation, and procedures for inspecting equipment prior to installation. Also explains how to prepare equipment prior to installation, the installation process for rotating equipment, and the procedures used to relieve pipe stress from rotating equipment.

Unit Alignment (40 Hours)
(Module ID 63302-02) Describes types of equipment misalignment and how to identify and correct them. Explains how to perform conventional, rim and face indicator, reverse dial indicator, and laser alignments. Also identifies other laser alignment procedures that may be completed on the machinery trains depending on equipment needs.

Volume 2

Introduction to Gas Compressors (10 Hours)
ISBN 978-0-13-038357-0
(Module ID 63206-02) Identifies gas compressors used in the transmission of gas through pipelines. Also explains the function and operation of compressors and identifies the auxiliary equipment used with compressors.

General Maintenance and Winterizing Pipeline Equipment (7.5 Hours)
(Module ID 62301-02) Explains preventive and predictive maintenance and general maintenance on rotating machinery. Discusses gas compressors and maintaining pumps and prime movers.

Install and Maintain Bearings (15 Hours)
(Module ID 63203-02) Introduces specialty tools and precision measuring tools and explains how to select, inspect, use, and care for these tools.

Specialty and Precision Tools (15 Hours)
(Module ID 63203-02) Introduces specialty tools and precision measuring tools and explains how to select, inspect, use, and care for these tools.

Identify Types of Valve Actuators/Operators (15 Hours)
(Module ID 63208-02) Identifies types of manual, electric, hydraulic, and pneumatic valve actuators used in the pipeline industry. Covers storage and handling, installation, and preventive maintenance procedures for these actuators.

Installing Seals and Gaskets (10 Hours)
(Module ID 63109-02) Covers the applications, removal procedures, and installation procedures for dynamic and static seals and O-rings. Also identifies gaskets and gasket materials and explains the procedures for laying out, cutting, and installing gaskets.

Introduction to Pneumatic Systems (10 Hours)
(Module ID 63201-02) Discusses pneumatic system safety, characteristics of gases and how they are compressed, pneumatic transmission of energy, and compressor operation.

Introduction to Hydraulic Systems (10 Hours)
(Module ID 63202-02) Discusses hydraulic system safety and the basic principles of hydraulics, including Pascal's law and Bernoulli’s principle. Explains the function of fluids, parts, pumps, and motors.

Installing and Maintaining Pipeline Equipment (7.5 Hours)
(Module ID 63107-02) Identifies types of valves used in the pipeline industry. Covers storage and handing, installation, and preventive maintenance for these valves.

Maintain and Repair Drivers (15 Hours)
(Module ID 63210-02) Identifies types of drivers that provide power to rotating equipment on pipelines. Explains how to inspect and replace drivers, replace bearings and seals, and perform preventive maintenance.

Install Rotating Equipment (25 Hours)
ISBN 978-0-13-038378-4
(Module ID 63301-02) Identifies inspection requirements for an equipment pod, requirements for equipment base preparation, and procedures for inspecting equipment prior to installation. Also explains how to prepare equipment prior to installation, the installation process for rotating equipment, and the procedures used to relieve pipe stress from rotating equipment.

Unit Alignment (40 Hours)
(Module ID 63302-02) Describes types of equipment misalignment and how to identify and correct them. Explains how to perform conventional, rim and face indicator, reverse dial indicator, and laser alignments. Also identifies other laser alignment procedures that may be completed on the machinery trains depending on equipment needs.

Continued on following page
Vibration Analysis (5 Hours)
(Module ID 63303-02) Covers common causes of vibration and how to minimize them. Includes vibration monitoring techniques, vibration analysis techniques, vibration test equipment, and how to field balance machines.

Maintain, Troubleshoot, and Repair Pumps (10 Hours)
(Module ID 63304-02) Identifies the preventive maintenance requirements, inspection requirements, and common troubleshooting techniques for pumps used in the pipeline industry. Also gives general guidelines for preparing a pump for shutdown, removing a pump from a pipeline system, disassembling a pump, installing the pump after the pump has been reassembled, and preparing the pump for startup and operational check after maintenance or repair has been completed.

Maintain, Troubleshoot, and Repair Gas Compressors (15 Hours)
(Module ID 63305-02) Identifies the typical lubrication system components, preventive maintenance requirements, and common troubleshooting techniques for a gas compressor. Also gives general guidelines for preparing a gas compressor for shutdown and repair, isolating a gas compressor from a pipeline system, repairing rotary and reciprocating gas compressors, and preparing a gas compressor for startup and operational check after maintenance has been completed.

INSPECTION

L2 PIPELINE MAINTENANCE

Curriculum Notes
• 132.5 Hours
• Revised: 2017, Third Edition
• Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.
• Available as print on demand
• To purchase individual covered task modules, please visit www.nccer.org/pipeline-program

PAPERBACK
Trainee Guide: $104.99
Individual Modules: $24.99

MODULES
The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Abnormal Operating Conditions - Control Center
(5 Hours)
ISBN 978-0-13-472782-0
(Module ID AOCCC-17)

Abnormal Operating Conditions - Field and Gas
(5 Hours)
ISBN 978-0-13-472784-4
(Module ID AOCFG-17)

Visually Inspect Surface Conditions of Right-of-Way
(5 Hours)
(Module ID CT15_1-17)

Inspect Navigable Waterway Crossing (5 Hours)
(Module ID CT16_1-17)

Routine Inspection of Breakout Tanks (API 653
Monthly or DOT Annual) (7.5 Hours)
(Module ID CT27_1-17)

Provide Security for Pipeline Facilities
(2.5 Hours)
ISBN 978-0-13-471763-0
(Module ID CT32_0-17)

Inspect Existing Pipe Following Movement
(5 Hours)
(Module ID CT34_0-17)

Inspect or Repair Support Structures on Existing
Aboveground Components (5 Hours)
(Module ID CT37_0-17)

Visually Inspect Pipe and Pipe Components Prior
to Installation (5 Hours)
(Module ID CT38_1-17)

Backfilling a Trench Following Maintenance (5 Hours)
(Module ID CT39_0-17)

Conduct Vegetation Survey (5 Hours)
(Module ID CT52_1-17)

Conduct a Leak Survey with a CGD (5 Hours)
(Module ID CT52_2-17)

Conduct a Leak Survey with a Flame Ionization
Unit (5 Hours)
(Module ID CT52_3-17)

Vault Maintenance (10 Hours)
(Module ID CT59_0-17)

Cold Cutting (10 Hours)
(Module ID CTC-CC-17)

Flange Bolting (15 Hours)
ISBN 978-0-13-471789-0
(Module ID CTMP-17)

Mud Plugging (5 Hours)
(Module ID CTMB-17)

Tubing (7.5 Hours)
(Module ID CT17-17)

Threaded Pipe Fabrication (15 Hours)
(Module ID CTTP-17)
### L3 PIPELINE MAINTENANCE

**Curriculum Notes**
- 187.5 Hours
- Revised: 2017, Third Edition
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.
- Available as print on demand
- To purchase individual covered task modules, please visit www.nccer.org/pipeline-program

The following ISBNs are for ordering individual modules only.

#### Abnormal Operating Conditions - Field and Gas
- **(5 Hours)**
  - Module ID AOCFG-17

#### Locate Line
- **(5 Hours)**
  - Module ID CT14_1-17

#### Install, Inspect, and Maintain Permanent Marker
- **(5 Hours)**
  - Module ID CT14_2-17

#### Install, Inspect, and Maintain Temporary Marker
- **(7.5 Hours)**
  - Module ID CT14_5-17

#### Launching In-Line Inspection Devices
- **(2.5 Hours)**
  - Module ID CT129_1-17

#### Receiving In-Line Inspection Devices
- **(5 Hours)**
  - Module ID CT129_2-17

#### Determine Allowable Line Pressure in Section of Pipe to be Moved
- **(5 Hours)**
  - Module ID CT33_1-17

#### Preparation for Movement Activities
- **(5 Hours)**
  - Module ID CT33_2-17

#### Moving In-Service Pipeline
- **(5 Hours)**
  - Module ID CT33_3-17

#### Safe Disconnect of Pipeline Facilities
- **(5 Hours)**
  - Module ID CT33_4-17

#### Purging of Pipeline Facilities
- **(5 Hours)**
  - Module ID CT36_1-17

#### Sealing a Disconnected Portion of Pipeline
- **(5 Hours)**
  - Module ID CT36_3-17

#### Visually Inspect That Welds Meet DOT Requirements (API 1104)
- **(5 Hours)**
  - Module ID CT38_3-17

#### Fit Full Encirclement Welded Split Sleeve
- **(10 Hours)**
  - Module ID CT40_1-17

#### Apply Composite Sleeve
- **(10 Hours)**
  - Module ID CT40_3-17

#### Install Mechanical Bolt-On Split Repair Sleeve
- **(15 Hours)**
  - Module ID CT40_4-17

#### Install Weldable Compression Couplings
- **(5 Hours)**
  - Module ID CT40_5-17

#### Install and Remove Plugging Machine
- **(7.5 Hours)**
  - Module ID CT40_6-17

#### Installing a Tap 2 Inches and Under on a Pipeline System
- **(15 Hours)**
  - Module ID CT40_8-17

#### Installing a Tap Larger Than 2 Inches on a Pipeline System
- **(15 Hours)**
  - Module ID CT40_9-17

#### Conduct Pressure Test
- **(15 Hours)**
  - ISBN 978-0-13-470997-0
  - Module ID CT41_0-17

#### Welding
- **(35 Hours)**
  - Module ID CT42_7-17

### L2 PIPELINE MECHANICAL

**Curriculum Notes**
- 67.5 Hours
- Revised: 2017, Third Edition
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.
- Available as print on demand
- To purchase individual covered task modules, please visit www.nccer.org/pipeline-program

The following ISBNs are for ordering individual modules only.

#### Abnormal Operating Conditions - Control Center
- **(5 Hours)**
  - Module ID AOCCC-17

#### Abnormal Operating Conditions - Field and Gas
- **(5 Hours)**
  - Module ID AOCCC-17

#### Valve Body Winterization or Corrosion Inhibition
- **(5 Hours)**
  - Module ID CT19_1-17

#### Valve Lubrication
- **(5 Hours)**
  - Module ID CT19_2-17

#### Valve Seat Sealing
- **(12.5 Hours)**
  - Module ID CT19_3-17

#### Valve Stem Packing Maintenance
- **(12.5 Hours)**
  - Module ID CT19_4-17

#### Adjust Actuator/Operator, Electric
- **(7.5 Hours)**
  - Module ID CT19_5-17

#### Adjust Actuator/Operator, Pneumatic
- **(7.5 Hours)**
  - Module ID CT19_6-17

#### Adjust Actuator/Operator, Hydraulic
- **(7.5 Hours)**
  - Module ID CT19_7-17

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**Module Notes**

- **80 Hours**
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.
- Available as print on demand
- To purchase individual covered task modules, please visit www.nccer.org/pipeline-program

**Trainee Guide:** $104.99  
**ISBN**  978-0-13-471645-9

**Individual Modules:** $24.99  
see module list

**PAPERBACK**

**MODULES**

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

**Abnormal Operating Conditions - Field and Gas**  
(5 Hours)  
ISBN  978-0-13-472784-4  
(Module ID AOCFG-17)

**Inspect Main-Line Valves** (7.5 Hours)  
(Module ID CT20_0-17)

**Repair Valve Actuator/Operator, Pneumatic** (7.5 Hours)  
ISBN  978-0-13-470674-0  
(Module ID CT21_1-17)

**Disassemble and Reassemble Valves** (7.5 Hours)  
(Module ID CT21_2-17)

**Internal Inspection of Valves and Their Components** (7.5 Hours)  
(Module ID CT21_3-17)

**Repair Valve Actuator/Operator, Hydraulic** (7.5 Hours)  
(Module ID CT21_4-17)

**Repair Valve Actuator/Operator, Electric** (7.5 Hours)  
(Module ID CT21_5-17)

**Inspect Tank Pressure/Vacuum Breakers** (5 Hours)  
(Module ID CT22_1-17)

**Inspect, Test, and Calibrate HVL Tank Pressure Relief Valves** (5 Hours)  
(Module ID CT22_2-17)

**Maintain and Repair Relief Valves** (5 Hours)  
ISBN  978-0-13-471747-0  
(Module ID CT22_3-17)

**Inspect, Test, and Calibrate Relief Valves** (5 Hours)  
ISBN  978-0-13-471750-0  
(Module ID CT23_1-17)

**Maintain and Repair Pressure Limiting Devices** (5 Hours)  
(Module ID CT24_1-17)

**Inspect, Test and Calibrate Pressure Limiting Devices** (5 Hours)  
(Module ID CT24_2-17)