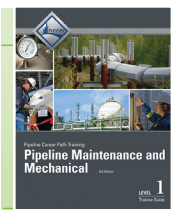




Pipeline Maintenance and Mechanical



L1 PIPELINE MAINTENANCE AND MECHANICAL



LEVEL 1

Curriculum Notes

- Volume 1: 140 Hours
- Volume 2: 205 Hours
- Revised: 2017, Third Edition
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.

PAPERBACK	ISBN
VOLUME 1	
Trainee Guide: \$104.99	978-0-13-480568-9
VOLUME 2	
Trainee Guide: \$104.99	978-0-13-480569-6
Individual Modules: \$24.99	see module list

MODULES

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

VOLUME 1

Pipeline Mechanic Hand and Power Tools

(10 Hours)

ISBN 978-0-13-038336-5

(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)

ISBN 978-0-13-038337-2

(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)

ISBN 978-0-13-038338-9

(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)

ISBN 978-0-13-038339-6

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

Identify Types of Valve Actuators/Operators

(15 Hours)

ISBN 978-0-13-038341-9

(Module ID 63108-02) 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)

ISBN 978-0-13-038342-6

(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)

ISBN 978-0-13-038351-8

(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)

ISBN 978-0-13-038352-5

(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.

Specialty and Precision Tools

(15 Hours)

ISBN 978-0-13-038353-2

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

Introduction to Metering Devices and Provers

(10 Hours)

ISBN 978-0-13-038357-0

(Module ID 63206-02) Identifies and explains the use of pipeline meters including positive displacement, turbine, ultrasonic, mass-flow, vortex, and orifice. Identifies and explains the use of provers including tank provers, traditional pipe provers, and small volume pipe provers.

Introduction to Pumps

(10 Hours)

ISBN 978-0-13-038358-7

(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.

Introduction to Gas Compressors

(10 Hours)

ISBN 978-0-13-038359-4

(Module ID 63208-02) 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)

ISBN 978-0-13-103156-2

(Module ID 62301-02) Explains preventive and predictive maintenance and general maintenance on rotating machinery. Discusses gas compressors and maintaining pumps and prime movers.

VOLUME 2

Tank Repair

(40 Hours)

ISBN 978-0-13-103162-3

(Module ID 62307-02) Explains complete tank repair, including flange tightening, nondestructive testing, electrically insulated fittings and flanges, welding, bottom repair, bottom replacement, moving, arc burn and weld repair, roof installation, shell plate replacement, aluminum and steel floating roof demolition, building a floating roof, floating roof in-service seal replacement, and nozzles, manways, and sumps.

Install and Maintain Bearings

(15 Hours)

ISBN 978-0-13-038350-1

(Module ID 62309-02) Identifies friction and antifriction bearings, bearing materials, and bearing designation. Gives procedures to remove, troubleshoot, and install bearings.

Install Mechanical Seals

(20 Hours)

ISBN 978-0-13-038361-7

(Module ID 63210-02) Explains the function and advantages of mechanical seals. Identifies parts and types of mechanical seals. Includes procedures for removing, inspecting, and installing mechanical seals.

Maintain and Repair Drivers

(15 Hours)

ISBN 978-0-13-038362-4

(Module ID 63211-02) 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 978-0-13-103178-4

(Module ID 63301-02) Identifies inspection requirements for an equipment pad, 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)

ISBN 978-0-13-103179-1

(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)

ISBN 978-0-13-103180-7

(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)

ISBN 978-0-13-103181-4

(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)

ISBN 978-0-13-103182-1

(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.

Maintain, Troubleshoot, and Repair Metering Devices and Provers (20 Hours)

ISBN 978-0-13-103187-6

(Module ID 63309-02) Explains how to inspect, maintain, and repair metering devices and prover systems. Also describes the waterdraw calibration procedures used to calibrate and verify the reliability of prover systems.

L2 PIPELINE MAINTENANCE

LEVEL 2

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

ISBN

Trainee Guide: \$104.99

978-0-13-471653-4

Individual Modules: \$24.99

see module list

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 AO CFG-17)

Visually Inspect Surface Conditions of Right-of-Way (5 Hours)

ISBN 978-0-13-471757-9

(Module ID CT15_1-17)

Inspect Navigable Waterway Crossing (5 Hours)

ISBN 978-0-13-471758-6

(Module ID CT16_1-17)

Routine Inspection of Breakout Tanks (API 653 Monthly or DOT Annual) (7.5 Hours)

ISBN 978-0-13-471761-6

(Module ID CT27_1-17)

Provide Security for Pipeline Facilities

(2.5 Hours)

ISBN 978-0-13-471763-0

(Module ID CT28_0-17)

Observation of Excavation Activities (5 Hours)

ISBN 978-0-13-471766-1

(Module ID CT32_0-17)

Inspect Existing Pipe Following Movement

(5 Hours)

ISBN 978-0-13-471768-5

(Module ID CT34_0-17)

Install or Repair Support Structures on Existing Aboveground Components (5 Hours)

ISBN 978-0-13-471770-8

(Module ID CT37_0-17)

Visually Inspect Pipe and Pipe Components Prior to Installation (5 Hours)

ISBN 978-0-13-471773-9

(Module ID CT38_1-17)

Backfilling a Trench Following Maintenance (5 Hours)

ISBN 978-0-13-471775-3

(Module ID CT39_0-17)

Conduct Vegetation Survey (5 Hours)

ISBN 978-0-13-471777-7

(Module ID CT52_1-17)

Conduct a Leak Survey with a CGD (5 Hours)

ISBN 978-0-13-471779-1

(Module ID CT52_2-17)

Conduct a Leak Survey with a Flame Ionization Unit (5 Hours)

ISBN 978-0-13-471782-1

(Module ID CT53_3-17)

Vault Maintenance (10 Hours)

ISBN 978-0-13-471784-5

(Module ID CT59_0-17)

Cold Cutting (10 Hours)

ISBN 978-0-13-471786-9

(Module ID CTCC-17)

Flange Bolting (15 Hours)

ISBN 978-0-13-472115-6

(Module ID CTFB-17)

Mud Plugging (5 Hours)

ISBN 978-0-13-471789-0

(Module ID CTMP-17)

Tubing (7.5 Hours)

ISBN 978-0-13-471791-3

(Module ID CTTB-17)

Threaded Pipe Fabrication (15 Hours)

ISBN 978-0-13-470685-6

(Module ID CTPP-17)

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L3 PIPELINE MAINTENANCE

LEVEL 3

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

PAPERBACK	ISBN
Trainee Guide: \$104.99	978-0-13-471652-7
Individual Modules: \$24.99	see module list

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 AO CFG-17)

Locate Line (5 Hours)

ISBN 978-0-13-470687-0
(Module ID CT14_1-17)

Install, Inspect, and Maintain Permanent Marker
(5 Hours)

ISBN 978-0-13-470689-4
(Module ID CT14_2-17)

Install, Inspect, and Maintain Temporary Marker
(7.5 Hours)

ISBN 978-0-13-470692-4
(Module ID CT14_5-17)

Launching In-Line Inspection Devices (2.5 Hours)

ISBN 978-0-13-470694-8
(Module ID CT29_1-17)

Receiving In-Line Inspection Devices (5 Hours)

ISBN 978-0-13-470696-2
(Module ID CT29_2-17)

Determine Allowable Line Pressure in Section of Pipe to be Moved (5 Hours)

ISBN 978-0-13-470698-6
(Module ID CT33_1-17)

Preparation for Movement Activities (5 Hours)

ISBN 978-0-13-470700-6
(Module ID CT33_2-17)

Moving In-Service Pipeline (5 Hours)

ISBN 978-0-13-470702-0
(Module ID CT33_3-17)

Safe Disconnect of Pipeline Facilities (5 Hours)

ISBN 978-0-13-470704-4
(Module ID CT36_1-17)

Purging of Pipeline Facilities (5 Hours)

ISBN 978-0-13-470706-8
(Module ID CT36_2-17)

Sealing a Disconnected Portion of Pipeline
(5 Hours)

ISBN 978-0-13-470709-9
(Module ID CT36_3-17)

Visually Inspect that Welds Meet DOT Requirements (API 1104) (5 Hours)

ISBN 978-0-13-470711-2
(Module ID CT38_3-17)

Fit Full Encirclement Welded Split Sleeve
(10 Hours)

ISBN 978-0-13-470713-6
(Module ID CT40_1-17)

Apply Composite Sleeve (10 Hours)

ISBN 978-0-13-470715-0
(Module ID CT40_3-17)

Install Mechanical Bolt-On Split Repair Sleeve
(15 Hours)

ISBN 978-0-13-470718-1
(Module ID CT40_4-17)

Install Weldable Compression Couplings
(5 Hours)

ISBN 978-0-13-470720-4
(Module ID CT40_5-17)

Install and Remove Plugging Machine (7.5 Hours)

ISBN 978-0-13-470722-8
(Module ID CT40_6-17)

Installing a Tap 2 Inches and Under on a Pipeline System (15 Hours)

ISBN 978-0-13-471005-1
(Module ID CT40_7-17)

Installing a Tap Larger Than 2 Inches on a Pipeline
(15 Hours)

ISBN 978-0-13-471002-0
(Module ID CT40_8-17)

Install and Remove Completion Plug on Pipelines Larger than 2 Inches (15 Hours)

ISBN 978-0-13-471000-6
(Module ID CT40_9-17)

Conduct Pressure Test (15 Hours)

ISBN 978-0-13-470997-0
(Module ID CT41_0-17)

Welding (15 Hours)

ISBN 978-0-13-472098-2
(Module ID CT42_7-17)

L2 PIPELINE MECHANICAL

LEVEL 2

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

PAPERBACK	ISBN
Trainee Guide: \$104.99	978-0-13-471647-3
Individual Modules: \$24.99	see module list

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 AO CFG-17)

Valve Body Winterization or Corrosion Inhibition
(5 Hours)

ISBN 978-0-13-470657-3
(Module ID CT19_1-17)

Valve Lubrication (5 Hours)

ISBN 978-0-13-470660-3
(Module ID CT19_2-17)

Valve Seat Sealing (12.5 Hours)

ISBN 978-0-13-470670-2
(Module ID CT19_3-17)

Valve Stem Packing Maintenance (12.5 Hours)

ISBN 978-0-13-470671-9
(Module ID CT19_4-17)

Adjust Actuator/Operator, Electric (7.5 Hours)

ISBN 978-0-13-470664-1
(Module ID CT19_5-17)

Adjust Actuator/Operator, Pneumatic (7.5 Hours)

ISBN 978-0-13-470672-6
(Module ID CT19_6-17)

Adjust Actuator/Operator, Hydraulic (7.5 Hours)

ISBN 978-0-13-470668-9
(Module ID CT19_7-17)

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L3 PIPELINE MECHANICAL

LEVEL 3

Curriculum Notes

- 80 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

ISBN

Trainee Guide: \$104.99

978-0-13-471645-9

Individual Modules: \$24.99

see module list

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 AO CFG-17)

Inspect Main-Line Valves (7.5 Hours)

ISBN 978-0-13-470673-3
(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)

ISBN 978-0-13-470677-1
(Module ID CT21_2-17)

Internal Inspection of Valves and Their Components (7.5 Hours)

ISBN 978-0-13-470679-5
(Module ID CT21_3-17)

Repair Valve Actuator/Operator, Hydraulic (7.5 Hours)

ISBN 978-0-13-470681-8
(Module ID CT21_4-17)

Repair Valve Actuator/Operator, Electric (7.5 Hours)

ISBN 978-0-13-471741-8
(Module ID CT21_5-17)

Inspect Tank Pressure/Vacuum Breakers (5 Hours)

ISBN 978-0-13-471743-2
(Module ID CT22_1-17)

Inspect, Test, and Calibrate HVL Tank Pressure Relief Valves (5 Hours)

ISBN 978-0-13-471745-6
(Module ID CT22_2-17)

Maintain and Repair Relief Valves (5 Hours)

ISBN 978-0-13-471747-0
(Module ID CT23_1-17)

Inspect, Test, and Calibrate Relief Valves (5 Hours)

ISBN 978-0-13-471750-0
(Module ID CT23_2-17)

Maintain and Repair Pressure Limiting Devices (5 Hours)

ISBN 978-0-13-471752-4
(Module ID CT24_1-17)

Inspect, Test and Calibrate Pressure Limiting Devices (5 Hours)

ISBN 978-0-13-471754-8
(Module ID CT24_2-17)

