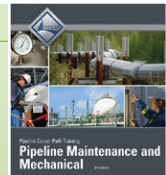


L1 PIPELINE MAINTENANCE AND MECHANICAL



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

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 63209-02) 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

Pipeline Maintenance and Mechanical (continued)

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.