Power Generation Maintenance Mechanic

L1 POWER GENERATION MAINTENANCE MECHANIC

LEVEl 1

Curriculum Notes

• 225 Hours
• Includes 100 hours of Power Industry Fundamentals, which is a prerequisite for Level One completion and must be purchased separately.
• Published: 2010
• Downloadable instructor resources that include module tests, PowerPoint®, and performance profile sheets are available at www.nccer.org/irc.

MODULES

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Continued on following page
Installing Mechanical Seals (20 Hours)
(Module ID 32404-09, from Industrial Maintenance Mechanic Level Four) Describes the preparation for reverse alignment, and explains the procedures for setting up reverse alignment jigs. Explains graphic and mathematical techniques for aligning equipment based on reverse dial indicator measurements.

Laser Alignment (25 Hours)
ISBN 978-0-13-610449-0
(Module ID 32405-09, from Industrial Maintenance Mechanic Level Four) Using one example system, describes the principles of using laser alignment systems to perform alignments.

Installing Belt and Chain Drives (10 Hours)
(Module ID 32307-08, from Industrial Maintenance Mechanic Level Three) Covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.

Introduction to Piping Components (5 Hours)
(Module ID 32202-07, from Industrial Maintenance Mechanic Level Two) Introduces chemical, compressed air, fuel oil, steam, and water systems. Explains how to identify piping systems according to color codes.

Copper and Plastic Piping Practices (5 Hours)
(Module ID 32203-07, from Industrial Maintenance Mechanic Level Two) Covers the selection, preparation, joining, and support of copper and plastic piping and fittings.

Conventional Alignment (30 Hours)
(Module ID 32206-08, from Industrial Maintenance Mechanic Level Three) Covers types of misalignment, aligning couplings using a straightedge and feeler gauge, adjusting parallel and angular alignment, using a dial indicator, and eliminating coupling stress.

Reverse Alignment (30 Hours)
(Module ID 32404-09, from Industrial Maintenance Mechanic Level Four) Introduces equipment used to transfer and remove heat from systems in process.

Hydrostatic and Pneumatic Testing (10 Hours)
(Module ID 32206-07, from Industrial Maintenance Mechanic Level Two) Describes non-destructive and pressure testing of systems and equipment.

Installing Fans and Blowers (10 Hours)
(Module ID 15312-08, from Millwright Level Three) Describes how to install axial-flow fans, centrifugal fans, and roots-type and screw-type blowers.

Heaters, Furnaces, Heat Exchangers, Cooling Towers and Fin Fans (30 Hours)
(Module ID 32211-07, from Industrial Maintenance Mechanic Level Two) Introduces equipment used to transfer and remove heat from systems in process.

Conveyors (5 Hours)
(Module ID 15401-08, from Millwright Level Four) Describes conveyors and their principles of operation.

Troubleshooting and Repairing Conveyors (12.5 Hours)
(Module ID 15402-08, from Millwright Level Four) Describes maintaining and repairing belt, roller, chain, screw, and pneumatic conveyors.

Covers iron and steel pipe and fittings and provides step-by-step instructions for cutting, threading, and joining ferrous piping.

Identify, Install and Maintain Valves (10 Hours)
(Module ID 32205-07, from Industrial Maintenance Mechanic Level Two) Explains how to remove and install threaded and flanged valves, how to replace valve stem O-ring and bonnet gaskets, and how to repack a valve stuffing box. Also discusses the purpose of valve packing.

Advanced Blueprint Reading (25 Hours)
(Module ID 32402-09, from Industrial Maintenance Mechanic Level Four) Describes the use of drawing sets to obtain system information. Explains the process of identifying a part of a machine for repair or replacement from a set of drawings.

Power Generation Maintenance Mechanic Level 2 (continued)
Power Generation Maintenance Mechanic Level 4

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

Vibration and Balancing (12.5 Hours)
(Module ID 52401-10) Reviews machine basics and explains the causes of machine vibrations. Reviews the basics of vibration analysis and covers the devices used to detect and analyze vibration signatures. Explains how and why vibration analysis is used as part of predictive maintenance programs. Describes field machine balancing.

Preventive and Predictive Maintenance
(10 Hours)
(Module ID 32401-09; from Industrial Maintenance Mechanic Level Four) Explains preventive and predictive maintenance and non-destructive testing, and introduces the basic techniques for testing. Also describes lubricant analysis, and acoustic, infrared, and vibration testing.

Fuel Preparation and Delivery Equipment
(25 Hours)
(Module ID 52402-10) Explains the basic operations of a coal-fired boiler system. Describes the delivery processes from the storage yard into the coal preparation equipment, and from the equipment into the furnace. Addresses the maintenance checks that need to be made on coal delivery and preparation equipment and explains how solid fuel wastes are disposed of in coal-burning furnace systems. Describes how other solid-fuel furnaces, such as biomass furnaces, are used with boilers.

Introduction to Tube Work
(10 Hours)
(Module ID 32212-07; from Industrial Maintenance Mechanic Level Two) Covers the basics of working with heat exchanger and furnace tubing and tube sheets.

Compressors and Pneumatic Systems
(35 Hours)
(Module ID 32403-09; from Industrial Maintenance Mechanic Level Four) Describes the theory and practice of compressing and transporting gases. Explains the types and principles of compressors and compressed air treatment equipment, as well as compressed air use and safety.

Troubleshooting and Repairing Pumps
(10 Hours)
ISBN 978-0-13-610452-0
(Module ID 32407-09; from Industrial Maintenance Mechanic Level Four) Explains how to inspect, troubleshoot, disassemble, assemble, and install a pump. Also describes the process of preparing for startup.

Troubleshooting and Repairing Gearboxes
(20 Hours)
(Module ID 32408-09; from Industrial Maintenance Mechanic Level Four) Describes types and operation of gearboxes, and gearbox diagnostics. Explains how to troubleshoot, remove, and disassemble gearboxes, how to identify gear wear patterns, and how to install and maintain gearboxes.

Setting Baseplates and Prealignment
(30 Hours)
(Module ID 32305-08; from Industrial Maintenance Mechanic Level Three) Explains how to lay out and install baseplates and soleplates. Describes how to field-verify a plate installation. Covers precision leveling procedures and performing clearance installation. Also describes basic steps for setting motors and pumps.

Turbines (20 Hours)
ISBN 978-0-13-610496-4
(Module ID 15505-09; from Millwright Level Five) Describes types of turbines and their components. Describes the operation and common applications of particular types, including gas, steam, and water turbines.

Maintaining and Repairing Turbine Components
(15 Hours)
(Module ID 15506-09; from Millwright Level Five) Describes the process of inspecting and repairing key components of turbines. Explains the guidelines for maintaining large steam turbines.