

L1 WIND TURBINE MAINTENANCE TECHNICIAN

LEVEL 1



Curriculum Notes

- Volume 1: 195 Hours
 - Includes 97.5 hours of *Power Industry Fundamentals*, which is a prerequisite for Level One completion and must be purchased separately.
 - Hardcover: \$79.99, ISBN 978-0-13-466829-1
- Volume 2: 110 Hours
- Published: 2011
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.
- *Introduction to Wind Energy* (Module ID 58101-11) has been approved for 15 general continuing education hours under GBCI's Credential Maintenance Program.

PAPERBACK

ISBN

VOLUME 1

Trainee Guide: \$34.99

978-0-13-271895-0

VOLUME 2

Trainee Guide: \$34.99

978-0-13-271896-7

VOLUME 1

MODULES

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

Introduction to Wind Energy (15 Hours)

Trainee \$22

ISBN 978-0-13-215452-9

(Module ID 58101-11) Introduces the fundamentals of generating electrical power from wind energy. A brief history of wind energy is included as well as wind science, the interception of wind energy through a rotor, and an identification of major wind turbine generator components.

Introduction to Wind Turbine Safety (12.5 Hours)

ISBN 978-0-13-272945-1

(Module ID 58102-11) Introduces safety concerns of working inside the wind turbine and in the wind farm environment. Expands on earlier safety training and provides coverage of electrical arc flash safety.

Climbing Wind Towers (40 Hours)

ISBN 978-0-13-272946-8

(Module ID 58103-11) Covers all aspects of climbing wind turbine lattice towers and tubular towers. Discusses proper climbing equipment and equipment inspection, environmental hazards, proper climbing techniques, and common wind turbine safe climbing guidelines.

Introduction to Electrical Circuits (7.5 Hours)

ISBN 978-0-13-257810-3

(Module ID 26103-11; from *Electrical Level One, Seventh Edition*) Introduces electrical concepts used in Ohm's law applied to DC series circuits. Covers atomic theory, electromotive force, resistance, and electric power equations.

Electrical Theory (7.5 Hours)

ISBN 978-0-13-257811-0

(Module ID 26104-11; from *Electrical Level One, Seventh Edition*)

Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis.

Electrical Test Equipment (5 Hours)

ISBN 978-0-13-257820-2

(Module ID 26112-11; from *Electrical Level One, Seventh Edition*)

Covers proper selection, inspection, and use of common electrical test equipment, including voltage testers, clamp-on ammeters, ohmmeters, multimeters, phase/motor rotation testers, and data recording equipment. Also covers safety precautions and meter category ratings.

Electrical Wiring (10 Hours)

ISBN 978-0-13-272947-5

(Module ID 58104-11) Describes types and applications of conductors as well as their installation techniques. Also describes the technique and components used for terminating and splicing conductors.

V2 VOLUME 2

MODULES

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

Alternating Current and Three-Phase Systems (17.5 Hours)

(17.5 Hours)

ISBN 978-0-13-274259-7

(Module ID 80201-11; from *Power Line Worker, Distribution Level Two*) Introduces the development of both single- and three-phase alternating current. Analyzes the relationship of AC phases and introduces key components used to refine AC power. Discusses the operation of transformers and introduces advanced AC concepts such as reactive power and the power factor.

Circuit Breakers and Fuses (10 Hours)

ISBN 978-0-13-272948-2

(Module ID 58105-11) Explains the necessity of overcurrent protection and the way it is applied in the wind turbine environment. Explores the operation of common circuit breakers and the differences in various fuse types. Overcurrent device terminology is presented, along with a review of the information found on such devices.

Switching Devices (12.5 Hours)

ISBN 978-0-13-272950-5

(Module ID 58106-11) Provides coverage of switching devices related to the power distribution and control of wind turbines. Mechanical and solid-state relay types are presented, as well as typical wind turbine control wiring diagrams. Explains various time delay schemes and how they can be applied.

Wind Turbine Power Distribution Systems (12.5 Hours)

(12.5 Hours)

ISBN 978-0-13-272951-2

(Module ID 58107-11) Discusses the basics of power generation and the generators used in wind turbines. Reviews how power is distributed and controlled during various modes of wind turbine operation. Simple one-line diagrams are also covered.

Fasteners and Torquing (20 Hours)

ISBN 978-0-13-272952-9

(Module ID 58108-11) Presents comprehensive coverage of wind turbine fasteners and their required characteristics. Covers torque theory, torquing, tensioning, and hydraulic torquing equipment. Presents the use and care of all significant torquing and tensioning tools. The use of taps and dies is also introduced.

Introduction to Bearings (15 Hours)

ISBN 978-0-13-272954-3

(Module ID 32207-07; from *Industrial Maintenance Mechanic Level Two*)

Introduces plain, ball, roller, thrust, guide, flanged, pillow block, and takeup bearings. Discusses bearing materials and designations.

Lubrication (12.5 Hours)

ISBN 978-0-13-272953-6

(Module ID 58109-11) Explores basic lubrication theory and related equipment. Includes the different applications and types of lubricants used in the wind turbine environment. Reviews OSHA's hazard communication program and the EPA's hazardous waste control program. Includes in-depth coverage of material safety data sheets.

Introduction to Hydraulic Systems (10 Hours)

ISBN 978-0-13-272957-4

(Module ID 58110-11) Covers all aspects of common hydraulic systems, including fluids, system components, and pumps.

Presents the principles of hydraulic system operation and the related components. Simple hydraulic system maintenance is also introduced.