

AC-DC MOTOR OPERATION & MAINTENANCE

COURSE TOPICS

AC MOTORS

1. AC MOTOR NAMEPLATES
2. THREE-PHASE MOTOR CONSTRUCTION OPERATION & APPLICATION
 - a) Squirrel-cage induction motors
 - b) Wound rotor motors
 - c) Synchronous motors
3. MOTOR COMPONENTS - BEST-PRACTICE MAINTENANCE & RELIABILITY
 - a) Stators, form coil & random windings
 - b) Rotors, barred & wound rotors
 - c) Insulation system
 - d) Laminated cores
 - e) Bearings
 - f) Slip rings
 - g) Multi-mode connections

DC MOTORS

1. DC MOTOR NAMEPLATES
2. DC MOTOR CONSTRUCTION OPERATION & APPLICATION
 - a) Shunt connected motors
 - b) Series connected motors
 - c) Compound connected motors
3. MOTOR COMPONENTS – BEST PRACTICE MAINTENANCE & RELIABILITY
 - a) Field windings
 - b) Armature windings
 - c) Commutators
 - d) Brushes
 - e) Insulation system
 - f) Laminated cores
 - g) Periodic inspections

MOTOR TESTING PROCEDURES & EVALUATION

INCLUDES HANDS-ON DEMONSTRATIONS (MOTOR SHOP)

1. Insulation resistance testing, includes dielectric absorption & polarization index
2. High-potential testing
3. Surge testing
4. Core-loss testing
5. Winding resistance & inductance measurements
6. Rotor bar testing, induction & quarter-voltage test
7. AC & DC voltage drop testing
8. DC motor neutral setting
9. Load testing

MOTOR REPAIR REPORTS & DOCUMENTATION

1. Motor repair/rebuild specifications
2. Industrial motor manufacturing & repair standards
3. Detailed cause of failure reports
4. Motor repair documentation
5. Energized test reports
6. Load testing reports
7. Installation documentation
8. Motor storage

COURSE DESCRIPTION & HANDS-ON DEMONSTRATIONS

COURSE CONTENT

This three-day workshop is a perfect fit for anyone who is responsible for maintaining, testing, troubleshooting, and repairing alternating and direct current motors. After completing this workshop attendees will have a good working knowledge regarding ac & dc motor operation, application, maintenance and testing focused on best-practice procedures. Squirrel-cage and wound rotor induction motors, plus synchronous motors (slip ring rotors and brushless rotors) are covered. Additionally, shunt, series and compound connected dc motors are covered. Paid attendees receive a course workbook that includes all the material covered in the workshop- a great manual for future reference. Course certificates for all attendees will be awarded upon completion of the course.

HANDS-ON DEMONSTRATIONS IN THE MOTOR SHOP

This is the part of the workshop where attendees see and participate in demonstrations of several motor shop tests and procedures for determining acceptance and suitability for repair and reliability.

1. Examine and inspect an assembled dc motor- check lead markings, field polarities, neutral setting, brush box spacing, brush box height, commutator film and total-indicated-runout (TIR), and perform an expected direction of rotation test.
2. Demonstrate a core loss test of a three-phase motor core and discuss test data for acceptance, repair or replacement.
3. Demonstrate procedures for checking squirrel-cage rotor integrity of a disassembled motor with a growler and a core loss tester.
4. Demonstrate the procedure for checking rotor bar integrity with the motor assembled (quarter-voltage test).
5. Demonstrate surge testing an assembled & disassembled three-phase squirrel-cage induction motor and discuss test results.
6. Perform ac & dc voltage drops on a dc machine and discuss test results.
7. Examine test equipment & test procedures for load testing dc motors using a dynamometer.