



Electrical Equipment & Control Systems: Commissioning, Testing & Start-Up

Course Description:

- The safe and efficient operation of modern electrical equipment and control systems requires the successful testing, start-up and commissioning of this equipment or system to ensure the correct operation plus accurate troubleshooting and subsequent repair of this equipment or system to ensure continued productivity.



The Training Course will highlight:

- The candidates are encouraged to raise queries both during and at any time after attending the seminar. They are also encouraged to bring with them any issues that they may have to this course.

Course objectives:

By the end of this course delegates will be able to:

- A better understanding of commissioning procedures
- A better understanding of troubleshooting procedures
- An improved capability in the use of test equipment
- A better understanding of failure modes and failure analysis
- A refreshed awareness of electrical safety concerns.

Course outline

The Technology of Electrical Equipment

- Transformers
- Power supplies (UPS)
- Batteries
- Generators
- Switchgear
- Motor control centers (MCC)
- Disconnect switches
- Neutral ground resistors (NGR)
- Variable frequency speed drives (VFDVSD)
- Programmable logic controllers (PLC) and distributed control systems (DCS)
- Power monitoring
- Control relays timers' switches
- Motor feeder protective devices
- Motors (AC and DC)
- Miscellaneous equipment - heaters, solenoid valves, electric valve actuators and signaling alarm devices

Course outline

Commissioning and Testing of Electrical Equipment

- Methods
- Terminology
- Principles
- Special techniques

Troubleshooting of Electrical Equipment

- Methods
- Terminology
- Principles
- Special techniques
- Case studies examples
- Single line drawings
- Group exercises

Course outline

The Use of Test Equipment

- Digital voltmeter (DVM)
- Oscilloscopes
- Megger
- Frequency meter
- Temperature probes pyrometers
- Ammeters
- Power meters
- Load banks
- Digital hydrometers
- Cable fault locators

The Interpretation and Use of Drawings

- Single-line electrical drawings
- Control schematics, Wiring lists
- Logic and standard symbols

Course outline

The Development of a Job Plan

- Identification of the troubleshooting step-by-step sequence
- Procedure preparation
- Documentation
- Follow-up, Safety considerations and training

The Identification and Repair of Problems Failures

- Common mode failures, Phase imbalance
- Contact pitting arcing
- Electronic component failure, Fusing
- Motor windings bearings brushes, Ballasts
- Excitation circuits, Battery cells, Inverters rectifiers
- Bushings, Switches, Control circuits, Ground faults

A Review of Safety Requirements

- Area classifications
- Electrical codes
- Safety information