



**MAESTRO**  
CONSULTANTS

**TROUBLESHOOT  
&  
DIAGNOSE  
FAULTS IN  
ELECTRICAL  
EQUIPMENT**

**COURSE OUTLINE 2020**

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## **TRAINING TITLE**

TROUBLESHOOT AND DIAGNOSE FAULTS IN ELECTRICAL EQUIPMENT

## **VENUE**

Dubai, UAE

## **DURATION**

5 Days

## **DATES**

20 - 24 September 2020

## **PRICE**

US\$4,000 per attendee including training material/handouts, morning/afternoon coffee breaks and Lunch buffet daily.

## **TRAINING INTRODUCTION**

This training course discusses the practical troubleshooting of electrical equipment and control circuits. It helps to increase the knowledge and skills of delegates in improving equipment productivity whilst reducing maintenance costs. This training course focuses on the main issues of troubleshooting electrical equipment and control circuits of today to enable delegates to walk onto their facilities to troubleshoot and fix problems as quickly as possible. The delegates will be able to identify, prevent and fix common electrical equipment and control circuits. The delegates will be aware of practical issues that go beyond typical electrical theory and focus on providing them with the necessary toolbox of skills in solving electrical problems which normally faced at industrial fields

## **TRAINING OBJECTIVES**

**Participants attending this program will be able to:**

- Diagnose electrical problems
- Eliminate the expensive trial and error approach
- Reduce unexpected downtime on electrical motors and other equipment
- Improve plant safety
- Learn specific techniques to troubleshoot equipment and control circuits
- Analyze Equipment problems

- Determine causes of equipment failure

## **TRAINING AUDIENCE**

Electrical engineers

- Junior Electrical engineers.
- Elect. Technicians
- Operations technicians
- Electrical technicians and supervisors

## **COURSE OUTLINE**

### **Basic Principles**

- a. Basic principles of Electrical machines
- b. AC Power systems
- c. Meters used in Trouble shooting

### **Devices, Symbols, and circuits**

- a. Devices and Symbols
- b. Electrical circuits
- c. Reading and understanding electrical drawings & Ladder logic
- d. Wires and terminal numbering

### **Basic Trouble Shooting principles**

- a. Basic principles in using a drawing and meter in trouble shooting circuits
- b. Checks for circuit continuity with disconnected supply
- c. Checks for circuit continuity with live supply
- d. Tests and methods
- e. Testing devices
- f. Circuits, wiring and connections
- g. Tests for installation and trouble shooting

### **Trouble shooting AC motors and starters**

- a. Fundamentals of 1 phase and 3 phase AC motors
- b. DC motors

- c. Motor enclosures
- d. Motor identification and connection diagram
- e. Motor rating and insulation types
- f. Starting of Motor – Forward and Reverse
- g. Motor Braking methods
- h. Measurements and motor testing
- i. Motor failures and methods to extend life

## **Switches, Circuit Breakers and Switchboard**

- a. Switches and Circuit Breakers
- b. Overloads and fault protection
- c. Switchboards
- d. Motor Control Centre

## **Troubleshooting Variable Speed Drive**

- a. Basics of VSD and its need
- b. Power electronic Rectifiers and Inverters (AC/DC/AC – Converters)
- c. Overall protection and diagnostics
- d. Installation and commissioning
- e. Power supply connections and earthing requirements
- f. Precautions for start/stop control of AC drives
- g. Control wiring for VSDs

## **Troubleshooting Control Circuits**

- a. Basic control circuits
- b. Ladder logic circuits
- c. Two-wire control
- d. Three-wire control – start/stop
- e. Jog/inch sequence
- f. Sequence start and stop
- g. Automatic sequence starting
- h. Reversing circuit
- i. Plug stop and anti-plug circuits
- j. Two-speed motor
- k. Overload protection
- l. Troubleshooting examples

- m. Troubleshooting strategies
- n. Ladder logic design exercise

### **Summary**

- a. Group Discussions
- b. Last Day Review & Assessments
- c. Q&A

### **TRAINING CERTIFICATE**

**MAESTRO CONSULTANTS** Certificate of Completion for delegates who attend and complete the training course

### **METHODOLOGY**

Our courses are highly interactive, typically taking a case study approach that we have found to be an effective method of fostering discussions and transferring knowledge. Participants will learn by active participation during the program through the use of individual exercises, questionnaires, team exercises, training videos and discussions of “real life” issues in their organizations. The material has been designed to enable delegates to apply all of the material with immediate effect back in the workplace.