

Control Circuit Operation & Troubleshooting

To dependably operate and maintain electrical equipment requires some key resources. The key resources necessary to experience success are skilled and knowledgeable personnel. Without the knowledge of these concepts the dependable operation of the equipment and the personnel themselves are at risk. When a power system failure occurs, all eyes within a facility are focused on the operations and maintenance department. Effective troubleshooting skills will significantly reduce the length of an outage, however, effective troubleshooting begins well in advance of an unexpected outage. This control circuit operation and troubleshooting program will provide the student with the information needed to troubleshooting and repair control circuits. The latest technology, standards, and materials available are presented and demonstrated. Anyone who works on or near power generation, transmission, or distribution systems should attend this course. Additionally, supervisors, managers, safety personnel, and those responsible for ensuring a safe work environment should attend this course.

Course Duration: 16 hours

INTRODUCTION

Purpose
Presentation Methods
Course Scope

DIAGNOSTIC MEASUREMENT TECHNIQUES

Voltmeter
Clamp-On Ammeter
Ohmmeter
Frequency Meter

CONTROL CIRCUIT FUNCTIONS

Safe operation
Protection
Remote operation
Automation

PROTECTIVE RELAYS

Motor Circuit Protectors
Thermal and Electronic Overloads
Ground Fault and Phase

IMBALANCE PROTECTION

Magnetic Contactors
Control and Timing Relays
Sensor Devices

CONTROL CIRCUIT OPERATION

Starting
Stopping
Loss and return of power
Reversing
Multiple speed systems
Multiple voltage systems
Soft start operation

CONTROL CIRCUIT TROUBLESHOOTING

Troubleshooting
Preventative Maintenance
Diagnostic
Case study
Repairs

POWER QUALITY

Types of Distortion
Sources of Distortion
Effects of Distortion
Mitigating Distortion