



Operation & Maintenance of Circuit Breakers, Switchgears & Capacitor Bank

Course Introduction:

The course details the actions required to commission LV switchgear to confirm that it works correctly and the specification has been met. The switchgear system can then be put into operation with confidence.

The completion of commissioning should also trigger the start of a cycle of maintenance of switchgear system that will keep the system functioning in a safe manner for the expected lifetime of the installation. The course goes into detail as to how this can be achieved. The course then examines performance, operation, installations and design concepts of switchgear, circuit breakers, and low voltage panel and capacitor bank

Course Objectives:

This course is intended to develop knowledge of:

- Design concepts of switchgear , circuit breakers and low voltage panel and capacitor bank
- Maintenance of low and high voltage circuit breakers and low voltage panel and capacitor bank
- Performance of switchgear, circuit breakers and low voltage panel and capacitor bank
- Testing of switchgear , circuit breakers and low voltage panel and capacitor bank

Who Should Attend?

This course is intended for managers, electrical engineers, maintenance engineers and electrical technicians who would like to expand their knowledge of preventive maintenance of switchgears and protection of electrical networks.

Course Outline:

Introduction to switchgear, circuit breakers and low voltage panel and capacitor bank

- Arc extinction
- Types of circuit breakers
- LV circuit breaker
- Characteristics of circuit breakers
- Re-striking voltage definition
- Recovery voltage definition
- Type of the relays
- Grounding in the electrical substations
- Properties of Sulphur Hexafluoride
- capacitors used in power factor correction

Types & Design of Circuit Breakers, switchgear, and low voltage panel and capacitor bank

- Air circuit breakers
- Blast air circuit breakers
- Minimum oil circuit breakers
- SF6 (Sulphur Hexafluoride) circuit breakers
- Vacuum circuit breakers
- Vacuum interrupter
- Insulated Metal-Clad
- Loading of the circuit breakers by capacitive loads
- Loading of the circuit breakers by inductive loads

Maintenance of Switchgears Circuit Breakers, and low voltage panel and capacitor bank

- Requirements
- Stand by and Safety Services
- Maintenance of air blast circuit breakers
- Maintenance of oil circuit breakers
- Maintenance of SF6 circuit breakers
- Maintenance of vacuum circuit breakers
- Maintenance of low voltage panel , CT , VT and capacitor bank

Testing of Circuit Breakers Switchgears, and low voltage panel and capacitor bank

- Testing of circuit breakers according to IEC
- Type tests
- Routine tests
- Installation tests
- Maintenance tests
- Factory tests

Circuit breaker Ratings & Protective Relays

- Types of protective relays
- Functions of protective relays
- Protection against the failure of circuit breaker operation
- Surge protection
- Breaking & making capacities of circuit breakers
- Short circuit calculations

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Fees:

To be advised as per course locations. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session