

Training Title

ELECTRICAL PROTECTION

Training Duration

5 days

Training Venue and Dates

REF EE101	ELECTRICAL PROTECTION	5 days	03 – 04 March, 2024	\$6,500	London, UK
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In the below 5 star hotel as mentioned. The exact venue will be informed once finalized.

1. Events at Marble Arch

Central Cluster Meetings, Events and Group Sales - The Cumberland Hotel and Thistle Marble Arch

T. +44 (0) 207 523 5060

W. clermonthotel.group | A. Thistle Marble Arch, Bryanston St, Marylebone, London, W1H 7EH

Training Fees

\$6,500 per participant for Public Training including Course Materials/Handouts, Tea/Coffee, Refreshments & International Buffet Lunch

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING OVERVIEW

Efficient and Safe Power Protection systems are vital to ensure no overload may occur and a smooth current is maintained at the level determined for the demand required. Safety systems also demand the highest standards of operations and maintenance and therefore Relay Protection Systems play a large part in the Electrical Power Process.

This 5 days course is designed to inform participants how Power systems operate & and safely maintain protection Systems.

The workshop features an introduction covering the need for protection, fault types and their effects, simple calculations of short circuit currents and system earthing.

COURSE OBJECTIVES

This course is designed to the participants:

- Understand the electrical characteristics of various electrical faults

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- Identify different types of protection systems, understand the purpose of each type of protection system and identify the zone of protection for a given relay
- Recognize modern protective relays and understand their basic operation
- Appreciate the characteristics and importance of voltage transformers and current transformers in achieving dependable and accurate electrical protection systems
- Understand the concept of protection system discrimination and appreciate its importance in improving security of supply
- Be familiar with the requirements for testing of protection systems
- An Increased level of knowledge of the theoretical aspects and Operation of Protective Relays
- Familiarity with the application, basic connections and internal schematics
- Ability to test several Relays (Electromagnetic & Solid State), including type 50 / 51, type 27 / 59, etc ...
- The Safety rules applicable
- The nature of different types of electrical faults and the effect these faults can have on company assets
- Understanding of electrical fault protection systems
- Practical solutions for specifying and operating protection systems
- Comprehensive understanding of principles and selection of protection relays and protection schemes
- Hands on work shop for short circuit & relay coordination using ETAP Power station.

WHO SHOULD ATTEND?

The course is aimed at Managers, Engineers, and Technicians responsible for the operation and maintenance of distribution equipment who will benefit from sharing experiences in the planning, organization, and implementation of maintenance activities.

TRAINING METHODOLOGY:

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

All presentations are made in excellent colorful power point. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

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COURSE OUTLINES

AC Breaking & Fundamentals of Short circuit

- Causes of Faults
- Sources of short-circuit Currents
- Fundamentals of Short-Circuit Currents
- Three-Phase Short Circuits
- Usefulness of Fault Calculation in the Study of Power System
- Symmetrical Fault Currents
- Asymmetrical Fault Currents
- Types of Faults/Magnitudes
- Symmetrical Components
- Importance and construction of sequence networks
- Calculation of asymmetrical faults using symmetrical components and MVA methods
- Overview to PU systems
- Related international standards
- Case studies using computer simulations (using ETAP Power station)

Introduction to Protective systems

- Relay Operation and Fundamentals
- CT & VT
- Different type of Relays (Functions, theory of operations & objectives).
- Classification of Faults and Protection Philosophy
- Relay co-ordination study
- Neutral earthing configurations.
- CT Hazards
- VT Hazards
- Modern protection relays/Microprocessor used with switchgear

Protection Schemes

- Feeder protection cable feeders and overhead lines.
- Transformer protection.
- Switchgear (busbar) protection.
- Motor protection relays.
- Generator protection.
- Recommended protection schemes of international standards and some brand name manufactures (Siemens, Schneider, etc...).
- Management of protection.

Co-ordinated Distribution Networks

- Methods of selectivity's.
- Cable Damage curve.

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- Motor starting curve.
- Transformer Z-curve.
- Fuse characteristics.
- LV Circuits breakers tripping curves (TM, SST, ..)
- Setting rules for coordination study.
- Principles of Protection Co-ordination, Discrimination and Relay Settings.
- Generator Protection
- Transformer Protection
- Line Protection
- Cable Protection
- Motor Protection
- Over-current Co-ordinations. New philosophies/constrains of co-ordination studies.
- IEEE Standard 242.
- Case studies using computer simulations (using ETAP Power station)

Relaying Testing, Maintenance & Failure Analysis

- CT & VT testing
- Relays testing
- Maintenance intervals
- Preventive maintenance & Corrective maintenance
- Troubleshooting and repair.
- Maintenance / Acceptance Testing
- Relay Installation and Removal
- Test Plug Usage
- Primary & Secondary Test Methods.
- Maintenance of Protection Relays and Reliability.

NOTE:

Pre & Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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MEETING ROOM PICTURES:



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P.O BOX 45304
ABU DHABI, U.A.E

T +971 2 6264455
F +971 2 6275344

www.definettraining.com