Electrical Fundamentals Training Course

Duration / Cost: 2 Days / £795.00
Format: Classroom training with worked examples and case studies
Assessment: Closed-book exam (60 questions, 70% pass mark required)
Course Handout Provided

Course Overview

This two-day Electrical Fundamentals course has been developed for engineers, technicians, and operational personnel working within power generation and industrial plant environments who require a clear, structured understanding of core electrical engineering principles.

The programme reinforces the essential theory that underpins safe operation, fault diagnosis, maintenance, and system decision-making within LV and HV electrical installations.

Rather than focusing on advanced modelling or complex design calculations, the course concentrates on strengthening technical understanding of:

- AC and DC principles
- Three-phase systems
- Power, power factor, and reactive energy
- Earthing and fault behaviour
- Protection fundamentals
- Transformers and rotating machines
- Electrical system configuration in power plant environments

The course bridges the gap between practical plant experience and the engineering theory that governs system behaviour.

Course Modules:

Electrical Fundamentals

- Voltage, current, resistance and impedance
- Ohm's Law and power calculations
- AC and DC principles
- Three-phase systems
- Real, reactive and apparent power
- Power factor
- Frequency and basic synchronisation
- Earthing fundamentals and fault current paths

Faults, Protection & System Safety

- Types of electrical faults
- Overcurrent and earth fault behaviour
- Basic protection philosophy
- Introduction to load flow and arc flash (awareness level)
- Stored energy and electrical hazards
- Link between electrical theory and safe isolation

Electrical Apparatus – Operation & Function

- Transformers
- Generators
- Induction and synchronous motors
- HV and LV switchgear
- Circuit breakers and isolators
- CTs and VTs
- Protective relays (fundamental principles)

Operational Awareness & Basic Electrical Testing

- Switchroom and substation hazards
- Identification of live apparatus
- Human factors and operational discipline
- Basic electrical testing principles (IR, continuity, phase checks)
- Relationship between testing, maintenance and system reliability

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Further Resources

This course is delivered with reference to current UK electrical legislation and recognised industry guidance to ensure alignment with safe working practice and industrial standards.

Key references include:

- Electricity at Work Regulations 1989
- BS 7671 – IET Wiring Regulations
- HSG85 – Electricity at Work: Safe Working Practices

Where relevant, broader industrial installation principles are discussed in the context of recognised UK and international standards.

For questions or follow-up, please contact:

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