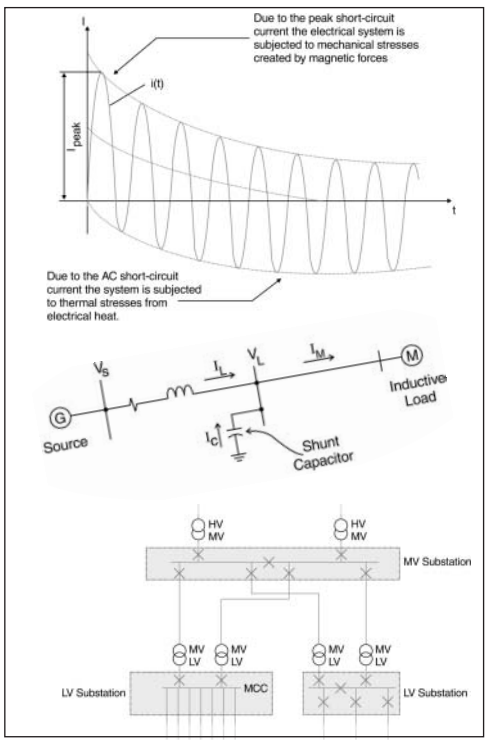
Practical

POWER DISTRIBUTION

for Engineers & Technicians



YOU WILL LEARN HOW TO:

- **Correctly implement the right type of switchgear for the appropriate application**
- **Economically select and install the best-suited power cable for a specific application**
- **Evaluate the need for power factor correction, and successfully implement correction strategies**
- **Implement successful maintenance strategies and procedures**
- **Effectively use software techniques to solve problem areas in your power network**

WHO SHOULD ATTEND:

- **Electrical Engineers**
- **Design Engineers**
- **Project Engineers**
- **Electrical Technicians**
- **Protection Technicians**
- **Equipment Technicians**
- **Maintenance Technicians**
- **Maintenance Supervisors**
- **Electricians**

IDC TECHNOLOGIES

Technology Training that Works

THE WORKSHOP

A practical two-day course in Power Distribution, focussing on medium voltage (1 kV – 36 kV) power considerations, switchgear, power cables, transformers, power factor correction, grounding/earthing, lightning protection and network studies.

You will gain technical know-how in these areas not covered by university or college programs.

WORKSHOP OBJECTIVES

This practical, two-day workshop will enable you to:

- Understand practical power distribution fundamentals
- Determine short-circuit ratings quickly and effectively
- Assess the influence of fault levels on switchgear ratings
- Select the correct type of switchgear for the right application
- Evaluate the advantages of modern state-of-the-art switchgear protection for your applications, including preventative maintenance information
- Recognise the different applications for various cable insulation types
- Know when and how to use single core cables vs three core cables
- Specify correct power cable installation methods
- Correctly utilise and protect power transformers
- Assess and specify correct grounding throughout your electrical network
- Determine the need for Power Factor Correction (PFC) for your environment
- Assess the economic justification for installing PFC equipment
- Correctly specify PFC equipment and be aware of practical consequences
- Confidently use software to solve and predict simple power network problems

PRACTICAL DESIGN SESSIONS

Throughout the two days you will perform practical design calculations to reinforce your understanding of each section.

PRACTICAL DEMONSTRATION

How to use computer simulation software to design and/or troubleshoot your electrical power network – important practical issues in doing fault level calculations, load flow forecasts, motor starting studies and equipment sizing.

THE PROGRAM

DAY ONE

INTRODUCTION
- Definition of power distribution
- Elements of a power distribution network
- Focus of workshop

FUNDAMENTALS OF POWER DISTRIBUTION
- Overview of basic electrical theory
- Basic design considerations
- Voltage considerations and improvement of voltage conditions
- Equipment generally used in power networks today

SHORT-CIRCUIT CURRENT CALCULATIONS
- Sources of fault current
- Fundamentals of short-circuit current calculations
- Assumptions and simplified calculations
- Restraints of simplified calculations
- Worked examples

MEDIUM VOLTAGE SWITCHGEAR
- Load currents and fault currents
- Switchgear capabilities and ratings
- Types of switchgear manufactured today and their applications
- Comparison of different types of insulation methods (air, oil, vacuum, SF6)
- Advantages and disadvantages of different types of medium voltage switchgear
- Internal arc proofing
- Modern protection relays used with switchgear
- Preventative maintenance
- Future trends

POWER CABLES
- Insulation types and their applications
- Cable losses and voltage drop
- Cable ratings and short-circuits
- Single core vs three core cables
- Cable installation
- Cable splicing and termination techniques

DAY TWO

TRANSFORMERS
- Classifications
- Specifications
- Power transformers
- Connections and voltage taps
- Transformer impedance
- Insulation methods
- Cooling techniques
- Star-point earthing
- Accessories and protection

COMPENSATION AND POWER FACTOR CORRECTION
- Various capacitive and reactive compensation methods
- Overview of power factor theory
- Causes and effects of low power factor
- Methods to improve power factor and benefits
- Caution: capacitors with induction motors
- Transients and capacitor switching
- Resonance and harmonics
- Protection of capacitor banks
- Economic justification for power factor correction

GROUNDING
- System grounding
- Equipment grounding and earthing of structures
- Electrical safety earthing
- Static grounding
- Lightning protection
- Ground resistance measurement
- Factors influencing ground resistance

OVERVIEW OF COMPUTER SIMULATION SOFTWARE
- Load flow studies
- Fault level studies
- Equipment sizing
- Motor starting studies

LATEST DEVELOPMENTS IN TECHNOLOGY
- Automation of power distribution networks
- Digital instrument transformers

> *Excellent experience, imports information freely.*
>
> Gavin Bloch

ON-SITE TRAINING

✔ **SAVE** over 50% by having an IDC workshop presented at your premises.

✔ Customise the training to **YOUR** workplace.

✔ Have the training delivered when and where you need it.

Contact us for a **FREE** proposal.