

# Introduction to Electrical Circuit Protection

# COBHAM

13-14 October 2010

Cobham Technical Services  
AccessERA



All modern industrial and commercial business processes rely on a continuous and secure supply of electricity, and electrical circuit protection plays a vital role in achieving this. In order to prevent severe supply disruption and minimise health and safety risks, systems need to be protected from the consequences of overload and fault conditions.

This course will give you an insight into electrical circuit protection systems, what they do and how they function. The course highlights the importance of electrical circuit protection, covers the protection of all major plants and provides an insight into selecting circuit settings and resolving protection issues, supported by practical workshops.

## Your programme

### Day one

08.45 Registration and refreshments

#### Protection basics

- Why do we need circuit protection?
- How can protection be achieved?
- Protection of plant and equipment
- Protection of site personnel
- Protection by system design
- Faults (causes, types)
- System arrangements that influence protection.

10.45 Refreshments

#### General design concepts

- Design philosophy
- Protection quality
- Protection zones
- Main and backup protection
- Types of fault
- Basic protection components
- HV protection components
- Overcurrent protection.

12.30 Lunch

#### Protection software introduction

#### General design concepts (continued)

- Grading by time and current
- Earth fault protection
- Unit protection
- Distance protection
- LV protection components
- Intertripping
- Summary.

15.15 Refreshments

#### Protection workshop

16.30 Close.

### Day two

08.45 Refreshments

#### Equipment protection

- Generators
  - Introduction
  - Small generators
  - Embedded generators
  - Large generators.
- Busbars and switchgear
  - Speed and stability
  - Main and check schemes
  - Frame earth leakage.
- Transformers
  - Types of fault
  - Small distribution transformers
  - Large industrial transformers.

10.45 Refreshments

#### Equipment protection (continued)

- Incomers and feeders
  - Differential protection
  - Overcurrent and earth fault protection
  - Distance protection.
- Motors
- UPS.

12.30 Lunch

13.30 Commissioning and testing

14.00 Protection workshop

- Worked examples.

#### Summary and questions

16.00 Close.

GlaxoSmithKline UK, delegate autumn 2009  
"Very useful course to understand protection systems."

## Ever thought about in-company training?

This course can be delivered at your site. To discuss your training requirements, please call The Events Team on +44 (0)1372 367439.



## Your speakers



### George McDowell - Head of Power Systems, Cobham Technical Services

George is an internationally renowned electrical power engineering expert and represents the company on a number of professional bodies. His work has focused on design, power quality, failure analysis, solving operational problems of power systems, earthing and lightning protection of structures, and electrical systems; involving him in a broad spectrum of applications in the industrial, commercial and utility sectors.



### Paul Mason - Principal Power Systems Engineer, Cobham Technical Services

Paul joined Cobham Technical Services Engineering Consultancy Services division in 2007. His main interests and activities are in power system studies, power quality measurements and operational problems of high voltage power plant for a wide range of clients in the industrial, commercial and utility sectors.

## Booking form

Please photocopy this form if you wish to register more than one delegate. Send a second person at a discounted price!

### Delegate details

Name <small>Dr Mr Mrs Miss</small>
Job Title
Organisation
Address
Postcode
Telephone
Fax
E-mail
VAT number <small>(EU customers only)</small>
<input type="checkbox"/> Please tick if you are happy to receive further information about Cobham Technical Services via e-mail. It is our policy NOT to supply your details to third parties.

### Bookings

I wish to make a firm booking for:

**Introduction to Electrical Circuit Protection**

13-14 October 2010 Ref: 31036

### Fees\*

Fee rate	Fee	VAT@17.5%	Total	Please tick
<b>Early Booking Rate</b>	<b>£740.00</b>	<b>£129.50</b>	<b>£869.50</b>	
<b>Standard Rate</b>	<b>£780.00</b>	<b>£136.50</b>	<b>£916.50</b>	

\*AccessERA subscribers and additional delegates receive a 10% discount on these rates. For more information on booking rates, please go to: <http://shop.era.co.uk>. If you subscribe to AccessERA and would like to use your AccessERA credits to attend, please contact The Events Team on: +44 (0)1372 367439.

### Payment method

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Payment has been made by bank transfer

VAT registration no: GB 209 7152 66

For AccessERA use only Project No 40003 \_\_\_\_\_

Invoice  Paid  AccessERA credits

BC12..... Date.....

### Venue:

Your course will take place at Cobham Technical Services, Cleeve Road, Leatherhead, Surrey KT22 7SA, UK. It is a 15 minute walk from Leatherhead main-line station. Visitor car-parking is available on-site. A location map and directions are available at: [www.era.co.uk/location](http://www.era.co.uk/location).

### Early booking rates:

Early booking rates are valid up to one calendar month before the date of the course and can only be claimed at the time of booking.

### Additional booking rates:

Additional booking rates are applicable to second and subsequent delegates and may only be claimed at the time of booking.

### Did you know?

An AccessERA subscription is an excellent way of accessing technical advice and information in the right format at the right time. All AccessERA subscribers receive a 10% discount on the current course price at time of booking, when the booking is made directly with the Events Team. To find out more, please call us on: +44 (0)1372 367439 or e-mail: [era.accessera@cobham.com](mailto:era.accessera@cobham.com).

### Ways to book:

- <http://shop.era.co.uk>  
Total security is assured and normal booking conditions apply.
- +44 (0)1372 367439 - please be prepared to quote a purchase order number or supply us with credit card details.
- +44 (0)1372 367009\*
- The Events Team, Cobham Technical Services, Cleeve Road, Leatherhead, Surrey KT22 7SA.

\* Please note that booking forms received without payment will be considered binding and invoiced automatically.

### Enquiries:

Please contact The Events Team by calling: +44 (0)1372 367439 or e-mail: [era.events@cobham.com](mailto:era.events@cobham.com).

### How to pay:

Payment must be made before attendance at the event and must be made in £ sterling only. Acceptable methods of payment are by cheque (payable to ERA Technology Ltd), credit card or bank transfer. Bank transfers, free of all charges, can be made to ERA Technology Ltd via: Barclays Bank PLC, PO Box 1824, Wimborne, Dorset, BH21 1YJ; sort code: 20-96-96, account no. 00327433. When paying by bank transfer, please quote the relevant course, reference number and the delegate and company name.

### Cancellations and transfers:

Cancellations and transfers must be received in writing. Cancellations and transfers received up to the 15th working day prior to the event will be subject to a charge of 20% of the invoiced course fee + VAT or 20% of the AccessERA credits charged. After this, 15 day deadline transfers cannot be accepted and cancellations will be subject to payment in full or 100% of the AccessERA credits charged. Substitutions can be made at any time.

### Cobham Technical Services:

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