Global Horizon
TRAINING CENTER

Training Course:
Electrical Faults: Causes, Analysis, Detection & Remedies

6 - 10 October 2025
Kuala Lumpur (Malaysia)
Royale Chulan Kuala Lumpur

Training Course:
Electrical Faults: Causes, Analysis, Detection & Remedies

Training Course code: EN6056 From: 6 - 10 October 2025 Venue: Kuala Lumpur (Malaysia) - Royale Chulan Kuala Lumpur
Training Course Fees: 6500 Euro

Introduction

The course is concerned with the calculation of fault currents in practical electrical power systems. Short-circuit currents are associated with large amounts of very destructive energy and therefore calculations must be made to ensure that the short-circuit ratings of equipment are adequate to cater to these high currents. In addition, an accurate assessment of these currents is also essential for determining the settings of the system protection devices.

The methods of analysis, used throughout the industry, are thoroughly explained in this seminar. A powerful engineering software package that makes complex and repetitive calculations easy to follow and the document is used throughout the seminar to ensure that attention to detail is not compromised and minimum simplifications are made. A considerable portion of the course is devoted to the application of these methods to practical systems, starting from the preparation of the system for analysis through the calculation process, by manual calculation and by the use of computer analysis to the point of application of the results. The course is illustrated by practical examples of systems including ones as explained in detail in industrial standards that engineers need to be familiar with and able to follow and apply. Finally, industrial software programs are introduced that are capable of modeling complex electrical systems and make power system fault analysis a relatively easy task for engineers provided that one is able to explain and understand the results a computer program gives. This is important as with any computer software-based application where if the input data are wrong, for whatever reason, the results are also wrong and one needs to be able to observe such errors and make engineering judgments for their correction.

Objectives

The objectives of this seminar are to present:

- The basic theory of a three-phase power system under balanced and unbalanced conditions.
- The per-unit system and analytical circuit based techniques to calculate industrial power systems for faults.
- Advanced engineering mathematical software that can be used to make difficult and complicated calculations an easy task.
- Balanced three-phase faults and unbalanced faults and their analysis using symmetrical components.
- Application of impedance reduction techniques and positive, negative and zero sequence circuits and their interconnection for faults.
- CAD driven PC based software that can be used to first confirm results of industrial power systems to be studied and analyzed during the course and its use for the analysis of more complicated systems.
- Case studies and industrial standards for medium and low voltage networks and how faults are calculated.

Benefits

At the end of the seminar, each delegate will:

- Learn how to collect in a structured way data and information needed for a power system prior to fault analysis.
- Be exposed to the analytical techniques to study a power system under various types of faults.
- Understand faults, their effect and different types of calculations involved with a short, medium and long time of these phenomena affecting the power system.
- Be able to assess the design and functionality of protective equipment.
- Become familiar with the latest software-based approaches to deal with complicated commercial and industrial power systems and their analysis under fault conditions.

Outlines

Day 1:

Introduction to fault analysis

- Introductions
- Goals - discussion
- Source of fault current
- Fault statistics
- Basic assumptions
- Short-circuit rating of the equipment
- Selecting the correct switchgear rating for fault duties
- Overview of the per-unit system
- One-line diagrams
- Sources of impedance data for all items of plant
- Tutorial to demonstrate the preparation of a system for the study
- Introduction to the engineering software used throughout the course to make complex and repetitive calculations as accurate as possible
- Closing discussion

Day 2:

Three-phase short-circuit currents

- Review - summary - discussion
- Manual calculation of three-phase short-circuit current
- Circuit reduction techniques
- Industrial systems
- Electricity supply systems
- Tutorial - based on attendees plant
- Cables subjected to short-circuit currents
- Compliance with regulations
- Closing discussion

Day 3:

Unsymmetrical fault conditions

- Review - summary - discussion
- Overview of symmetrical components
- Consideration of various fault types
- Sequence networks
- Consideration of phase shift in two-winding transformers
- Consideration of earth impedance
- Consideration of three-winding transformers
- Closing discussion

Day 4:

Representation of unsymmetrical faults in power systems

- Review - summary - discussion
- Fault diagrams

- Interconnected sequence networks
- Special considerations with reference to limitation of earth fault current
- Demonstration examples based on industrial power systems
- Closing discussion

Day 5:

Computer-based calculation of faults

- Review - summary - discussion
- Introduction to a scaled-down industrial program capable to model complex power systems under fault conditions
- Use of the software program in practical studies checking manual calculations
- Industrial standards
- Case studies of faults in a high voltage network
- Case study of faults in a low voltage network

Registration form on the Training Course: Electrical Faults: Causes, Analysis, Detection & Remedies

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Complete & Mail or fax to Global Horizon Training Center (GHTC) at the address given below

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Person Responsible for Training and Development

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