SCANDINAVIAN ACADEMY

Training and Development

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

Code	City	Hotel	Start	End	Price	Language - Hours
576	Beirut (Lebanon)	Hotel Meeting Room	2025-12-28	2026-01-01	3050 €	En - 25

Why Choose this Course?

This course teaches practical electrical troubleshooting and is concerned with the calculation of fault currents in 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 for these high currents. Accurate assessment of these currents is also essential for determining the settings of the system protection devices.
This course includes the preparation of the system for analysis, by manual calculation and by the use of computer analysis. Participants will be introduced to the various fault analysis software programs.

This course will feature:

- Identification of causes of electrical faults
- Understanding three phase short circuit currents
- Recognition of unsymmetrical faults in transformers
- Representation of unsymmetrical faults in a power system
- Manual and software assisted of fault currents

What are the Goals?

By the end of this course, participants will be able to:

- Understand the various types of fault currents
- Determine the causes of overcurrent and short circuit current
- Explain differences between symmetrical and unsymmetrical faults
- Analyse the common faults in a power system
- Interpret manual calculation verses software aided fault current calculations

Who is this Course for?

This course will benefit all levels of personnel in an electrical installation. It will enable them to identify the causes and apply analysis of electrical faults in a power system.

This course is suitable to a wide range of technical professionals but will greatly benefit:

- Electricians
- Electrical supervisors
- Plant electricians
- Operations & maintenance engineers, supervisors & technicians
- Maintenance technicians

How will this be Presented?

This course will utilise a variety of proven adult training techniques to ensure maximum understanding, comprehension and retention of the information presented. This includes presentation and discussion of case studies (with appropriate solutions), latest videos, technologies, and various commercial fault current analysis software.
Questions are encouraged throughout, particularly at the daily wrap up sessions. This provides opportunities for participants to discuss with the Presenter specific issues and, if possible, find appropriate solutions. Specific goals of each participant will be discussed to ensure that their needs are fulfilled whenever practicable.

The Course Content

Day One

Introduction to fault analysis

- Source of fault current in an electrical installation
- Common fault statistics of electrical equipment
- Short-circuit rating of equipment
- Selecting the correct switchgear rating for fault duties
- Overview of per-unit system and one line diagrams
- Sources of impedance data for all items of plant

Day Two

Three-phase short-circuit currents

- Review – summary – discussion
- Manual calculation of three-phase short-circuit current
- Industrial systems and fault current analysis
- Tutorial – based on attendees plant
- Cables subjected to short-circuit currents
- Compliance with regulations

Day Three

Unsymmetrical fault conditions

- Overview of symmetrical components and faults
- Consideration of various fault types

- Sequence networks
- Consideration of phase shift in two-winding transformers
- Consideration of earth impedance
- Consideration of three-winding transformers

Day Four

Representation of unsymmetrical faults in power systems

- Review – summary – discussion
- Fault diagrams of electrical equipment
- Interconnected sequence networks
- Special considerations with reference to limitation of earth fault current
- Demonstration examples based on industrial power systems
- Introduction to fault current analysis software

Day Five

Computer based calculation of faults

- Introduction to a scaled down fault analysis software
- Common network faults
- Industrial standards namely ANSI, NEC & NFPA 70 compliance
- Case studies of faults in a high voltage network
- Case study of faults in a low voltage network
- Q&A and wrap up session

The Scandinavian Academy for Training and Development employs modern methods in training and skills development, enhancing the efficiency of human resource development. We follow these practices:

- **Theoretical Lectures:**
  - We deliver knowledge through advanced presentations such as PowerPoint and visual materials, including videos and short films.
- **Scientific Assessment:**
  - We evaluate trainees skills before and after the course to ensure their progress.
- **Brainstorming and Interaction:**
  - We encourage active participation through brainstorming sessions and applying concepts through role play.
- **Practical Cases:**
  - We provide practical cases that align with the scientific content and the participants specific needs.
- **Examinations:**
  - Tests are conducted at the end of the program to assess knowledge retention.
- **Educational Materials:**
  - We provide both printed and digital scientific and practical materials to participants.
- **Attendance and Final Result Reports:**
  - We prepare detailed attendance reports for participants and offer a comprehensive program evaluation.
- **Professionals and Experts:**
  - The programs scientific content is prepared by the best professors and trainers in various fields.
- **Professional Completion Certificate:**
  - Participants receive a professional completion certificate issued by the Scandinavian Academy for Training and Development in the Kingdom of Sweden, with the option for international authentication.
- **Program Timings:**
  - Training programs are held from 10:00 AM to 2:00 PM and include coffee break sessions during lectures.