MERCURY

Electrical Faults: Causes, Analysis, Detection & Remedies Course

6 – 10 September 2027
Boston (USA)



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Ref: 6056_310532 **Date:** 6 – 10 September 2027 **Location:** Boston (USA) **Fees:** 9500 Euro

Introduction

The electrical fault analysis, remedies, and power system course delves into the methodology for calculating fault currents in practical electrical power systems. The electrical fault analysis, remedies, and power system course is imperative in the context of electrical safety to analyze subjects to short-circuit currents as they carry significant destructive energy.

The equipment must have adequate short-circuit ratings to handle such high currents. Precise computation of these currents is critical for calibrating system protection devices accordingly. Industry-standard analysis techniques are elucidated in this electrical fault analysis, remedies, and power system course.

In this electrical fault analysis, remedies, and power system course, a comprehensive engineering software package is employed throughout the seminar to ensure detailed attention and minimize simplifications. The curriculum emphasizes applying these techniques to actual systems, ranging from system analysis preparation and manual and computer-aided calculation processes to the final application of results.

Practical examples aligned with industrial standards are provided to help engineers become adept at following and applying the necessary procedures. Additionally, the electrical fault analysis, remedies, and power system course introduces industry software that simplifies the modeling and analysis of complex electrical systems, facilitating more accessible fault analysis. However, understanding and interpreting the software-generated results remains essential, as inaccuracies in input data can lead to unreliable outcomes.

Electric Power Steering Faults: Detection and Analysis

In this electrical fault analysis, remedies, and power system course, we will focus on diagnosing and analyzing electric power steering electrical faults within the context of our comprehensive electrical fault-finding course. We will explore common causes of electrical faults within power steering systems, essential troubleshooting techniques, and offer remedies for such electric motor faults.

The electrical fault analysis, remedies, and power system course aims to enhance participants' electrical fault detection and electrical fault analysis skills, specifically in the area of power steering systems, which are critical for vehicle safety and operation.

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Targeted Groups

- Electricians.
- Design electrical engineers.
- Electrical supervisors.
- Plant electricians.
- Operations and maintenance engineers, supervisors, and technicians.
- Maintenance technicians.

Course Objectives

At the end of this electrical fault analysis, remedies, and power system course, participants will be able to:

- Grasp the basic theory of balanced and unbalanced three-phase power systems.
- Understand per-unit systems and analytical techniques for calculating industrial power systems' faults.
- Employ advanced engineering math software for simplifying complex calculations.
- Analyze three-phase balanced and unbalanced faults using symmetrical components.
- Apply impedance reduction techniques and understand positive, negative, and zero sequence circuits for fault analysis.
- Utilize CAD-driven PC-based software for validating study results and analyzing more complex systems.
- Systematically gather data and information required for power system fault analysis.

Targeted Competencies

By the end of this electrical fault analysis, remedies, and power system course, the target competencies will be able to:

- Identification of causes of electrical faults.
- Comprehension of three-phase short circuit currents.
- Recognition of unsymmetrical faults in transformers.
- Understanding the partial discharge phenomena and its analysis.
- Graphical representation of unsymmetrical faults in a power system.
- Manual and software-assisted calculation of fault currents.
- Simulation for protection relay configuration.

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Course Content

Unit 1: Introduction to Fault Analysis

- Source of fault current.
- Fault statistics.
- Fundamental assumptions.
- Equipment short-circuit rating.
- Proper switchgear rating for fault duties.
- Per-unit system overview.
- One-line diagrams.
- Source impedance data for plant components.
- Tutorial showcasing system preparation for analysis.
- Introduction to engineering software for precise calculations.

Unit 2: Three-Phase Short-Circuit Currents

- Manual calculation of three-phase short-circuit current.
- Circuit reduction methods.
- Industrial systems.
- Electricity supply systems.
- Tutorial using attendees' plant data.
- Cables are subject to short-circuit currents.
- Regulatory compliance.

Unit 3: Unsymmetrical Fault Conditions

- Symmetrical components overview.
- Analysis of various fault types.
- Sequence networks.
- Phase shift in transformers.
- Earth impedance considerations.
- Analysis involving three-winding transformers.

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Unit 4: Representation of Unsymmetrical Faults in Power Systems

- Fault diagrams.
- Interconnected sequence networks.
- Limitation of earth fault current.
- Practical examples based on industrial power systems.

Unit 5: Computer-Based Calculation of Faults

- Scaled-down industrial program for complex power system modeling under fault conditions.
- Software utilization for practical study validation.
- Reference to industrial standards.