Global Horizon
TRAINING CENTER

Training Course:
Electrical Operation and Protection (theoretical approach)

8 - 12 November 2026
Cairo (Egypt)

Training Course:
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Training Course code: EN236625 From: 8 - 12 November 2026 Venue: Cairo (Egypt) - Training Course Fees: 4410 Euro

Introduction

The Electrical Operation and Protection Theoretical Approach training program is designed by Global Horizon Training Center to provide participants with a comprehensive understanding of the fundamental principles, concepts, and practices related to electrical system operation and protection.

The program focuses on the theoretical aspects of electrical power systems, including electrical system components, operating principles, protection systems, fault conditions, protective devices, circuit breakers, relays, transformers, motors, and electrical safety. Participants will develop a solid understanding of how electrical systems operate and how protection schemes are designed to detect and isolate electrical faults.

Through structured theoretical discussions, technical examples, and practical case studies, the program enables participants to better understand electrical protection concepts and their application in industrial and commercial electrical systems.

Objectives

By the end of the training program, participants will be able to:

- Understand the fundamental principles of electrical power system operation.
- Identify the main components of electrical power systems.
- Understand normal and abnormal electrical operating conditions.
- Explain the purpose and principles of electrical protection systems.
- Understand different types of electrical faults and their effects.
- Identify the functions of protective relays and circuit breakers.
- Understand protection principles for transformers, motors, generators, and feeders.
- Explain overcurrent, earth-fault, differential, and distance protection concepts.
- Understand basic protection coordination principles.
- Recognize common causes of electrical system failures.
- Understand electrical protection requirements and safe operating practices.
- Apply theoretical knowledge to common electrical operation and protection scenarios.

Course Methodology

The training program uses a structured and interactive theoretical approach, including:

- Instructor-led technical presentations.
- Detailed explanations of electrical operation and protection concepts.
- Electrical diagrams and simplified protection schemes.
- Technical examples and practical scenarios.
- Case studies based on common electrical system conditions.
- Group discussions and knowledge-sharing sessions.
- Fault analysis and protection-related exercises.
- Question-and-answer sessions.
- Review and discussion of key concepts at the end of each training day.

Organizational Impact

The program can contribute to organizational performance by:

- Improving personnel understanding of electrical system operation.
- Strengthening awareness of electrical protection principles.
- Supporting safer electrical system operation.
- Reducing the risk of equipment damage caused by electrical faults.
- Improving understanding of protective devices and protection schemes.
- Supporting more effective electrical troubleshooting and fault analysis.
- Improving communication between electrical engineering, operations, and maintenance teams.
- Supporting better decision-making related to electrical system operation.
- Enhancing awareness of electrical system reliability and continuity.

Target Audience

This program is suitable for:

- Electrical Engineers.

- Electrical Technicians.
- Electrical Maintenance Engineers and Technicians.
- Power System Engineers.
- Electrical Operations Personnel.
- Maintenance Supervisors and Managers.
- Plant and Facility Engineers.
- Control and Instrumentation Engineers.
- Utility Engineers and Technicians.
- Project Engineers involved in electrical systems.
- Engineering and Technical Managers.
- Professionals seeking to strengthen their knowledge of electrical operation and protection.

Outlines

Day 1 - Fundamentals of Electrical Power System Operation

- Introduction to Electrical Power Systems
- Generation, Transmission and Distribution Systems
- Main Electrical System Components
- Transformers, Switchgear, Busbars and Feeders
- Electrical System Configurations and Single-Line Diagrams
- Electrical Quantities: Voltage, Current, Power and Frequency
- Active, Reactive and Apparent Power
- Power Factor and Electrical System Reliability

Day 2 - Electrical Faults and Protection Principles

- Fundamentals and Objectives of Electrical Protection
- Normal and Abnormal Operating Conditions
- Types of Electrical Faults and Short-Circuit Conditions

- Three-Phase, Phase-to-Phase and Earth Faults
- Causes and Effects of Electrical Faults
- Fault Current Characteristics
- Protection Zones and Protection Schemes
- Primary and Backup Protection

Day 3 - Protective Devices, Relays and Circuit Breakers

- Protective Devices and Their Functions
- Current Transformers and Voltage Transformers
- Protective Relays: Types, Functions and Operating Principles
- Overcurrent and Earth-Fault Protection
- Overvoltage and Undervoltage Protection
- Circuit Breakers, Fuses and Tripping Mechanisms
- Relay Operating Characteristics and Trip Signals
- Basic Principles of Relay Testing

Day 4 - Protection of Major Electrical Equipment

- Transformer Protection Principles and Protection Schemes
- Transformer Differential, Overcurrent and Earth-Fault Protection
- Generator Protection Fundamentals
- Generator Faults and Abnormal Operating Conditions
- Motor Protection and Motor Fault Conditions
- Feeder and Cable Protection
- Busbar Protection and Differential Protection
- Protection Response During Equipment Faults

Day 5 - Protection Coordination, Reliability and Safe Operation

- Fundamentals of Protection Coordination and Selectivity

- Discrimination, Sensitivity and Protection Speed
- Coordination Between Relays and Circuit Breakers
- Backup Protection and Protection System Failures
- Basic Protection Settings and Fault Analysis
- Electrical System Reliability and Continuity
- Electrical Protection and Safe Operating Practices
- Case Studies, Final Review and Knowledge Assessment

Registration form on the Training Course: Electrical Operation and Protection (theoretical approach)

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

Delegate Information

Full Name (Mr / Ms / Dr / Eng): .....
Position: .....
Telephone / Mobile: .....
Personal E-Mail: .....
Official E-Mail: .....

Company Information

Company Name: .....
Address: .....
City / Country: .....

Person Responsible for Training and Development

Full Name (Mr / Ms / Dr / Eng): .....
Position: .....
Telephone / Mobile: .....
Personal E-Mail: .....
Official E-Mail: .....

Payment Method

- ☐ Please find enclosed a cheque made payable to Global Horizon
- ☐ Please invoice me
- ☐ Please invoice my company

Easy Ways To Register

Telephone: +201095004484 to provisionally reserve your place.	Fax your completed registration form to: +20233379764	E-mail to us : info@gh4t.com or training@gh4t.com	Complete & return the booking form with cheque to:Global Horizon 3 Oudai street, Aldouki, Giza, Giza Governorate, Egypt.