Global Horizon
TRAINING CENTER

Training Course:
Power Quality: Problems & Solutions

4 - 8 October 2026
Cairo (Egypt)

Training Course:
Power Quality: Problems & Solutions

Training Course code: EN236619 From: 4 - 8 October 2026 Venue: Cairo (Egypt) - Training Course Fees: 4410 Euro

Introduction

Power quality has become a critical concern in modern electrical power systems due to the increasing use of sensitive electronic equipment, variable frequency drives, renewable energy systems, power electronics, automation technologies, and nonlinear loads. Poor power quality can result in equipment malfunction, production interruptions, overheating, premature equipment failure, increased energy losses, and significant operational costs.

This training program, designed by Global Horizon Training Center, provides participants with a comprehensive understanding of power quality problems, their causes, impacts, measurement techniques, and appropriate mitigation solutions. The program covers voltage disturbances, harmonics, transients, interruptions, voltage unbalance, flicker, power factor, grounding issues, and other common power quality phenomena encountered in industrial and commercial electrical systems.

Throughout the program, participants will learn systematic approaches for identifying and analyzing power quality problems and selecting suitable corrective measures. The course also addresses power quality monitoring, harmonic mitigation, power factor correction, surge protection, grounding, filtering, and equipment protection.

The program emphasizes practical problem-solving and enables participants to develop effective strategies for improving electrical system reliability, efficiency, and equipment performance.

Objectives

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

- Understand the fundamental principles of electrical power quality.
- Identify common power quality disturbances and their characteristics.
- Recognize the causes and consequences of voltage sags, swells, interruptions, and fluctuations.
- Understand harmonic distortion and its impact on electrical equipment.
- Evaluate power factor and its influence on electrical system performance.
- Understand voltage and current unbalance.
- Identify electrical transients and appropriate protection methods.
- Understand grounding and wiring problems affecting power quality.
- Apply appropriate power quality monitoring and measurement techniques.
- Interpret basic power quality measurements and indicators.

- Identify sources of power quality problems within electrical systems.
- Understand harmonic filtering and mitigation techniques.
- Select appropriate power factor correction methods.
- Evaluate solutions for voltage disturbances and sensitive loads.
- Develop systematic approaches for troubleshooting power quality problems.
- Improve electrical system reliability and equipment performance.

Course Methodology

The course uses a structured and application-oriented methodology combining theoretical principles with practical power quality analysis.

The methodology includes:

- Instructor-led technical presentations.
- Power quality concepts and waveform analysis.
- Electrical system diagrams and illustrations.
- Power quality measurement examples.
- Analysis of common electrical disturbances.
- Technical calculations and simplified examples.
- Case-based troubleshooting scenarios.
- Comparison of mitigation technologies and solutions.
- Discussion of industrial power quality problems.
- Daily reviews and knowledge consolidation.

Organizational Impact

The program can contribute to improved electrical reliability, equipment performance, and operational continuity by strengthening the organization's capability to identify and manage power quality problems.

Key organizational benefits include:

- Improved reliability of electrical power systems.
- Reduction in equipment failures caused by poor power quality.

- Reduced production interruptions and unplanned downtime.
- Improved protection of sensitive electrical and electronic equipment.
- Better identification and diagnosis of electrical disturbances.
- Improved management of harmonic distortion.
- Enhanced power factor and electrical system efficiency.
- Reduced electrical losses and unnecessary operating costs.
- Improved coordination between electrical engineering, operations, and maintenance teams.
- More effective selection of power quality mitigation equipment.
- Improved preventive maintenance and troubleshooting capabilities.
- Increased awareness of power quality risks associated with modern electrical loads.

Target Audience

This training program is suitable for:

- Electrical Engineers
- Power System Engineers
- Maintenance Engineers
- Electrical Maintenance Supervisors
- Plant Engineers
- Facility Engineers
- Utility Engineers
- Operations Engineers
- Reliability Engineers
- Energy Engineers
- Electrical Technicians and Supervisors
- Power Generation Professionals
- Transmission and Distribution Professionals
- Industrial Automation Professionals

- Project Engineers
- Engineering Consultants
- Technical Managers
- Professionals responsible for electrical system reliability and performance

Course Outline

Day 1 - Power Quality Fundamentals

- Introduction to electrical power quality
- Power quality terminology and key parameters
- Characteristics of ideal electrical power
- Sources and categories of power quality disturbances
- Voltage, current, frequency, and waveform characteristics
- RMS values and electrical waveform fundamentals
- Power quality impacts on industrial equipment
- Introduction to applicable power quality standards

Day 2 - Voltage Disturbances & Transients

- Voltage sags and their causes
- Voltage swells and overvoltage conditions
- Short and long-duration interruptions
- Voltage fluctuations and flicker
- Voltage unbalance and its effects
- Electrical transients and surge phenomena
- Effects on motors, drives, control systems, and sensitive equipment
- Voltage disturbance mitigation techniques

Day 3 - Harmonics & Power Factor

- Fundamentals of harmonic distortion

- Linear versus nonlinear electrical loads
- Major sources of harmonics
- Total Harmonic Distortion THD
- Effects of harmonics on transformers, motors, cables, and capacitors
- Harmonic resonance
- Fundamentals of power factor
- Causes and consequences of poor power factor
- Power factor correction methods
- Harmonic filtering and mitigation solutions

Day 4 - Power Quality Monitoring & Troubleshooting

- Principles of power quality monitoring
- Power quality measurement parameters
- Selection and positioning of monitoring points
- Understanding power quality analyzers
- Interpreting voltage and current measurements
- Identifying disturbance patterns
- Grounding and wiring-related power quality problems
- Root-cause analysis of power quality events
- Systematic power quality troubleshooting methodology

Day 5 - Power Quality Solutions & System Improvement

- Power quality mitigation strategy
- Passive and active harmonic filters
- Surge protection devices
- Voltage regulation solutions
- Uninterruptible Power Supply UPS systems

- Dynamic voltage restoration concepts
- Power factor correction equipment
- Grounding and bonding improvements
- Protecting sensitive electrical loads
- Selecting appropriate mitigation solutions
- Developing a power quality improvement plan
- Course review and key learning outcomes

Registration form on the Training Course: Power Quality: Problems & Solutions

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

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Payment Method

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