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Course Name

Power Quality & Electrical System Performance

Sector Name

Electrical Engineering

Document Type

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Power Quality & Electrical System Performance

Course Introduction

Electrical equipment can remain operational while the quality of the power supplying it is steadily creating performance problems. Harmonics, voltage variations, phase imbalance, transients, poor power factor, and waveform distortion can contribute to overheating, nuisance tripping, equipment malfunction, reduced efficiency, premature component ageing, and unexplained operational disturbances. Because these symptoms can appear in different parts of the system, identifying the real power-quality problem often requires more than checking whether voltage is simply present or absent.

Boost Consulting & Training has designed this course to develop a practical approach to investigating and improving power quality in electrical systems. Participants will learn how to recognize disturbance patterns, determine suitable measurement strategies, interpret electrical data, connect symptoms with likely sources, evaluate the interaction between loads and the distribution system, and select appropriate corrective measures. Attention is given to modern electrical environments containing nonlinear loads, electronic equipment, variable-speed drives, and other power-electronic devices.



The main concept of this course is to turn power-quality measurements and operating symptoms into engineering decisions that improve equipment performance, electrical efficiency, and overall system stability.

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Target Audience

- ✓ Electrical and power systems engineers
- ✓ Electrical maintenance engineers
- ✓ Plant and facility electrical engineers
- ✓ Technical operations and engineering professionals

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Learning Objectives

- ✓ Identify major power-quality disturbances and their effects on electrical systems.
- ✓ Recognize equipment and operating symptoms associated with poor power quality.
- ✓ Plan appropriate measurements for investigating different power-quality problems.
- ✓ Interpret voltage, current, harmonic, imbalance, transient, and power-factor information.
- ✓ Trace likely disturbance sources within electrical distribution systems.
- ✓ Evaluate the impact of nonlinear and power-electronic loads on system performance.
- ✓ Select appropriate mitigation and correction measures for identified problems.
- ✓ Develop practical power-quality improvement solutions based on engineering evidence.

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Power Quality & Electrical System Performance

Course Outline

✓ DAY 01

Recognizing Power Quality Problems

Power Quality & Equipment Behavior

- ✓ Connecting supply characteristics with equipment performance, reliability, and operational stability
- ✓ Recognizing voltage sags, swells, interruptions, imbalance, distortion, and other common disturbances
- ✓ Distinguishing power-quality symptoms from equipment-specific faults and conventional supply failures

Tracing Disturbances Through the Electrical System

- ✓ Identifying internal and external sources of electrical disturbances
- ✓ Examining how sensitive loads respond differently to the same supply condition
- ✓ Developing a Power Quality Symptom Map from realistic operating problems

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Course Outline

✓ DAY 02

Measuring & Interpreting Electrical Disturbances

Building the Measurement Strategy

- ✓ Selecting measurement locations according to symptoms, system configuration, and suspected sources
- ✓ Determining the electrical parameters and monitoring duration required for investigation
- ✓ Avoiding misleading conclusions caused by incomplete or poorly positioned measurements

Reading Power Quality Data

- ✓ Interpreting voltage and current trends, event records, waveforms, and disturbance patterns
- ✓ Connecting measurement timestamps with equipment trips and operational events
- ✓ Completing a Power Quality Investigation Exercise using recorded electrical data

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Course Outline

✓ DAY 03

Harmonics & Nonlinear Loads

Understanding Harmonic Distortion

- ✓ Examining harmonic generation from variable-speed drives, electronic loads, converters, and other nonlinear equipment
- ✓ Understanding harmonic effects on transformers, cables, motors, capacitors, and neutral conductors
- ✓ Interpreting total harmonic distortion and harmonic spectrum information in practical investigations

Controlling Harmonic Problems

- ✓ Identifying amplification and resonance conditions within electrical systems
- ✓ Comparing filtering, equipment selection, system configuration, and other mitigation approaches
- ✓ Conducting a Harmonic Mitigation Challenge for a nonlinear-load scenario

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Course Outline

✓ DAY 04

Voltage, Balance & Power Factor Performance

Managing Voltage & Phase Conditions

- ✓ Investigating voltage variation, phase imbalance, flicker, and transient events
- ✓ Evaluating their effects on motors, sensitive equipment, and production processes
- ✓ Identifying system and load conditions contributing to recurring voltage problems

Improving Reactive Power & Power Factor

- ✓ Understanding reactive power demand and its impact on electrical system capacity and losses
- ✓ Evaluating capacitor compensation and the interaction between correction equipment and harmonics
- ✓ Developing a Power Performance Improvement Solution for a realistic facility case

Power Quality & Electrical System Performance

Course Outline

✓ DAY 05

Solving Power Quality Problems in Practice

Selecting the Right Corrective Response

- ✓ Matching mitigation solutions to the identified disturbance rather than treating symptoms
- ✓ Comparing source-side, distribution-level, and equipment-level corrective measures
- ✓ Evaluating technical effectiveness, operational impact, and potential unintended consequences

From Investigation to Improved Performance

- ✓ Establishing verification measurements after corrective actions are implemented
- ✓ Tracking power-quality indicators and recurring equipment-performance issues
- ✓ Completing an Integrated Power Quality Improvement Case from initial symptoms through diagnosis, correction, and verification

Power Quality & Electrical System Performance

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 21, 2026	Dec. 25, 2026	5 days	4250.00 \$	UAE , Abu Dhabi

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