

# € TRAINING

Energy Audit & Management





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## Introduction:

This training course explores the topic of power quality and its effects on the reliability of the electrical system. Power quality is first precisely defined, because, without a precise definition, measurements of baseline conditions and assessments of improvement are impossible. Then methods of evaluating reliability are investigated. After completing this course, you will have a thorough understanding of how power quality and reliability can be measured, and how changes made to the electrical system will affect these important properties

## Course Objectives:

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

- Raise the professional standards of those engaged in energy auditing.
- Improve the practice of energy auditors by encouraging energy auditing professionals in a continuing education program of professional development.
- Identify persons with acceptable knowledge of the principles and practices of energy auditing through completing an examination and fulfilling prescribed standards of performance and conduct.
- Award special recognition to those energy auditing professionals who have demonstrated a high level of competence and ethical fitness in energy auditing.

## Targeted Audience:

- Experienced auditors
- Managers of large audit teams
- Facility managers and engineers
- Commissioning team members
- Utility program managers and engineers
- Energy auditors or corporate energy managers
- Energy management personnel from the government and the military

## Course Outlines:

### Unit 1: Introduction, Voltage Sags and Interruptions:

- Power quality definition and basics
- Quantifying power quality
- ITI curve
- Causes of voltage sags
- Causes of interruptions
- Mitigation methods

### Unit 2: Transient Voltage Excursions:

- Motor starting
- Switching and traveling waves
- Capacitor switching

- Lightning
- Lightning shielding and grounding
- Ferroresonance

### Unit 3: Reliability Indices, Effects of Fault Clearing on Power Quality:

- IEEE-defined reliability indices
- Interpreting reliability indices
- Fault clearing
- Reclosing strategies
- Fuse saving philosophy
- Fuse blowing philosophy

### Unit 4: Insulation Coordination, Arresters, and Steady-State Voltage Regulation:

- Basic impulse level
- Insulation systems
- Insulation testing
- Arrester selection and application
- Load tap changers and voltage regulators
- Effects of steady-state voltage on system operation

### Unit 5: Harmonics:

- Fundamentals of harmonics
- Causes and effects of harmonics
- AC power and power factor
- Mitigating harmonic effects
- K-factor transformers
- Harmonic filters