



Energy Audit & Management Training Course



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Introduction:

This energy audit and management training course explores power quality and its effects on electrical system reliability. First, power quality is precisely defined, which is crucial because establishing baseline conditions and gauging improvements would be easier with a detailed definition.

The energy audit and management course then delves into methods of evaluating reliability. Upon completion, participants will have a comprehensive understanding of how power quality and reliability can be measured, alongside the implications of modifications to the electrical system.

Energy Management and Energy Audit:

When discussing energy efficiency, it is essential to understand what an energy audit is and the role of energy management. Energy audits systematically review operations and equipment that consume energy to identify cost-effective savings.

This energy audit and management course addresses the fundamental concepts, procedures, and benefits of energy auditing and management, aiming to provide a robust energy management certificate to those who complete the training successfully.

Targeted Groups:

- Engineers and technicians new to the power industry.
- Intermediate-level engineers and technicians aiming to enhance system reliability.
- Professionals involved with the assessment of power quality.
- Facility engineers and consultants tasked with addressing power quality issues.
- Engineers responsible for monitoring system performance and reliability.

Course Objectives:

After engaging in this energy audit and management training program, participants will be able to:

- Grasp expected power quality and reliability terminology.
- Evaluate the impact of voltage sags on sensitive equipment.
- Understand how fault clearing affects voltage stability.
- Utilize standardized reliability indices in their assessments.
- Identify sources of transient overvoltages and specify arresters appropriately.
- Recognize harmonic production causes and apply mitigation strategies.
- Analyze AC power components and their correlation with voltage regulation.

Targeted Competencies:

At the end of this energy audit and management training course, the target competencies will be able to:

- Power quality and reliability assessments.
- Voltage sags and outage management.
- Power system fault-clearing effects.
- Calculation of reliability indices.
- Transient overvoltage strategies, including arresters.
- Harmonic understanding and mitigation techniques.
- Analysis of AC power and voltage regulation in steady-state conditions.

Course Content:

Unit 1: Introduction to Energy Management, Voltage Sags and Interruptions:

- Power quality definition and basics.
- Quantifying power quality.
- ITI curve and its relevance to energy management.
- Causes and mitigation methods of voltage sags.
- Understanding interruptions and their impact on power systems.
- Practical strategies to improve power quality and energy management.

Unit 2: Energy Audit and Transient Voltage Excursions:

- Motor starting dynamics
- Switching, traveling waves, and their effects on energy auditing
- Capacitor switching considerations in energy management
- Assessing the impact of lightning on power systems
- Best practices in lightning shielding and grounding
- Understanding Ferroresonance in the context of energy audits

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

- Exploring IEEE-defined reliability indices.
- Interpreting these indices within the context of an energy management audit.
- The role of fault clearing in power quality.
- Reclosing strategies and their effects on energy management.
- Fuse saving philosophy in energy management audits.
- Fuse-blowing philosophy.

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

- Basic impulse level and its relevance to energy auditors.
- Insulation systems.
- Insulation testing methods.
- Selecting and applying arresters in energy management.
- Understanding load tap changers and voltage regulators.
- Analyzing steady-state voltage effects on power system operation.

Unit 5: Harmonics in Energy Auditing:

- Understanding the fundamentals of harmonics.
- Identifying causes and effects of harmonics within energy audit parameters.
- The relationship between AC power and power factor.
- Methods to mitigate the effects of harmonics.
- K-factor transformers and their application in energy management.
- Harmonic filters and their role in energy audits.

Conclusion:

Participants in this energy audit and management course will be equipped with an extensive understanding of energy management training, energy audit training, certification, and practical applications of these skills.