

Course No. 1146

Industrial Electrical Systems Training Course

ELECTRICAL ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Industrial Electrical Systems Training Course is a comprehensive professional development program designed to equip engineers, electrical technicians, maintenance professionals, operations personnel, and engineering managers with the knowledge and practical skills required to design, operate, maintain, troubleshoot, and optimize industrial electrical systems. Industrial electrical systems are fundamental to the safe, reliable, and efficient operation of manufacturing plants, oil and gas facilities, power generation stations, petrochemical complexes, utilities, mining operations, water treatment plants, and large commercial infrastructures. Their performance directly affects equipment availability, operational continuity, energy efficiency, and workplace safety.

Modern industrial facilities rely on complex electrical infrastructures that include power generation, transmission, distribution, motor control systems, transformers, switchgear, protection systems, variable frequency drives (VFDs), electrical panels, grounding systems, emergency power systems, and industrial automation equipment. Proper engineering design, preventive maintenance, and systematic troubleshooting are essential to minimizing downtime, improving asset reliability, ensuring electrical safety, and complying with international engineering standards. This course provides participants with practical engineering knowledge based on globally recognized industry best practices.

Throughout the program, participants will develop a comprehensive understanding of industrial electrical engineering principles, electrical power distribution, electrical protection systems, motor control technologies, transformer operation, switchgear applications, cable systems, electrical testing, preventive and predictive maintenance, fault diagnosis, condition monitoring, power quality analysis, energy management, and electrical safety. Practical engineering exercises and real industrial case studies enable participants to apply theoretical concepts to real operational challenges while strengthening technical decision-making capabilities.

The Industrial Electrical Systems Training Course also demonstrates how industrial electrical engineering integrates with maintenance management, reliability engineering, asset management, operational excellence, energy efficiency, engineering safety, digital transformation, and continuous improvement initiatives. By completing this course, participants will be prepared to improve electrical system reliability, reduce maintenance costs, optimize energy utilization, strengthen engineering decision-making, enhance operational safety, and support sustainable engineering operations across government entities, ministries, public sector organizations, financial institutions managing engineering infrastructure, oil and gas companies, power generation facilities, petrochemical

industries, manufacturing organizations, utilities, mining companies, and multinational corporations.

Objectives

- Analyze the engineering principles governing industrial electrical systems and power distribution networks.
- Develop practical knowledge for operating, maintaining, and managing industrial electrical equipment.
- Evaluate electrical system performance using engineering calculations, operational data, and performance indicators.
- Apply electrical engineering principles to improve system reliability, efficiency, and operational safety.
- Design operational improvement strategies that optimize electrical power distribution and equipment performance.
- Improve electrical system operation through effective inspection, testing, monitoring, and maintenance practices.
- Strengthen troubleshooting capabilities by identifying electrical faults and conducting systematic root cause analysis.
- Implement preventive, predictive, and reliability-centered maintenance strategies for industrial electrical systems.
- Assess power quality, energy efficiency, and opportunities for electrical system optimization.
- Align industrial electrical engineering practices with organizational objectives for safety, reliability, asset management, regulatory compliance, and operational excellence.

Who Should Attend

This course is designed for electrical engineers, maintenance engineers, operations engineers, power systems engineers, reliability engineers, instrumentation engineers, project engineers, utility engineers, commissioning engineers, electrical technicians, maintenance supervisors, operations supervisors, engineering technicians, maintenance planners, equipment inspectors, engineering consultants, and technical professionals responsible for industrial electrical systems.

The program is equally valuable for engineering managers, maintenance managers, operations managers, plant managers, facility managers, project managers, procurement engineers, asset

management professionals, HSE specialists, quality professionals, executive managers, technical advisors, and decision makers responsible for electrical infrastructure, industrial maintenance, operational reliability, engineering asset management, and energy efficiency.

Professionals working within government entities, ministries, public sector organizations, financial institutions managing engineering infrastructure, oil and gas companies, petrochemical industries, refineries, power generation facilities, manufacturing plants, mining operations, water treatment facilities, utility providers, transportation infrastructure, marine industries, and multinational engineering organizations will benefit significantly from the practical engineering methodologies and internationally recognized industrial electrical engineering practices covered throughout the course.

Learning Outcomes

- By the end of this course, participants will be able to:
- Explain the operating principles and architecture of industrial electrical systems.
- Analyze electrical distribution networks and evaluate system performance.
- Apply electrical engineering principles to improve equipment reliability and operational efficiency.
- Interpret electrical drawings, single-line diagrams, and technical specifications.
- Identify electrical faults and perform systematic troubleshooting and root cause analysis.
- Develop preventive and predictive maintenance programs for electrical equipment.
- Evaluate the performance of transformers, switchgear, motors, protection systems, and control equipment.
- Apply electrical testing, condition monitoring, and power quality analysis techniques.
- Implement engineering safety procedures during electrical operation, maintenance, testing, and commissioning.
- Support operational excellence through effective industrial electrical system management, asset reliability, and continuous improvement.

Course Outline

DAY 01

Fundamentals of Industrial Electrical Systems

- Fundamentals of electrical engineering and industrial power systems
- Electrical generation, transmission, and distribution
- Industrial electrical equipment and system architecture
- Electrical drawings, single-line diagrams, and technical documentation

PRACTICAL

Practical workshop on interpreting industrial electrical system documentation

DAY 02

Electrical Equipment and Power Distribution

- Transformers and power distribution systems
- Switchgear, circuit breakers, and protection devices
- Industrial motors and motor control systems
- Variable Frequency Drives (VFDs) and motor starters

PRACTICAL EXERCISE

Practical exercise on electrical equipment selection and distribution system analysis

DAY 03

Operation, Maintenance, and Testing

- Electrical system operation and maintenance strategies
- Preventive, predictive, and reliability-centered maintenance
- Electrical testing, insulation testing, and condition monitoring
- Power quality analysis and energy management

DAY 03 — CONTINUED

PRACTICAL

Practical workshop on maintenance planning and electrical system testing

DAY 04

Troubleshooting, Protection, and Safety

- Electrical fault diagnosis and troubleshooting methodologies
- Protection coordination and fault analysis
- Grounding systems and electrical protection
- Electrical safety standards, lockout/tagout (LOTO), and operational risk management

PRACTICAL APPLICATION

Practical application involving electrical fault investigation and corrective action planning

DAY 05

Advanced Industrial Electrical Systems Management

- Electrical asset lifecycle management
- Reliability improvement and operational excellence
- Performance measurement and engineering best practices
- Continuous improvement strategies for industrial electrical systems

FINAL WORKSHOP

Final workshop involving the development of a comprehensive Industrial Electrical Systems management plan integrating electrical distribution, maintenance planning, equipment reliability, fault analysis, condition monitoring, energy optimization, electrical safety, asset management, and continuous improvement to maximize operational reliability, energy efficiency, and engineering excellence.



Register or Request More Information

Course page: <https://quest-training.com/courses/industrial-electrical-systems-training-course>

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