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COURSE BROCHURE

# Advanced Electrical Power Systems for Non-Engineers Training Course

12 – 23 July 2027
Dar es Salaam

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Registered in the United Kingdom and Saudi Arabia

# Advanced Electrical Power Systems for Non-Engineers Training Course

**Ref:** 262_8403 **Date:** 12 – 23 July 2027 **Location:** Dar es Salaam **Fees:** 14000 GBP

Electrical Power Systems for Non-Engineers is a 2-week training course for managers, commercial staff, finance and procurement professionals in utilities and large energy users who work beside engineers every day, and who leave with a Technical Proposal Challenge Checklist for judging the next engineering request on their desk. Grid investment, tariff reform and renewable growth now put technical choices in front of non-technical decision makers. Jupiter Prime Training delivers this course on electrical power systems for non-engineers.

## Why Electrical Power Systems for Non-Engineers Matters Now

Three forces bring electrical power systems for non-engineers onto the agenda today. Utilities are spending heavily on new substations, cables, meters and renewable connections, and the people who approve budgets and contracts need to question those proposals intelligently. Tariff structures and customer expectations are changing, so commercial staff must explain why prices, losses and outages behave as they do. Boards and investors ask how the energy transition affects reliability. An organisation whose non-technical leaders follow the engineering logic approves sound projects faster and spots weak ones early; one that does not either rubber-stamps or blocks without reason. The course rests on the basic physics of electricity and the established structure of generation, transmission and distribution.

## Who Gains Most from Electrical Power Systems for Non-Engineers

- Commercial staff responsible for customer contracts, tariffs and connection offers
- Finance professionals who appraise capital requests for grid and plant investment
- Procurement specialists who buy transformers, cables, switchgear and engineering services
- Managers in legal, regulatory affairs and communications who explain outages and projects
- Asset owners in industry and real estate who negotiate with the electricity supplier

A utility business support function or the commercial arm of a large industrial energy user gains most when finance, procurement and commercial colleagues attend together.

## Electrical Power Systems for Non-Engineers Capabilities

Participants gain the vocabulary and mental models to follow engineering discussions and ask questions that change outcomes.

- Assess where a proposal sits in the generation, transmission and distribution chain — capital approval meetings
- Calculate basic power, energy and loss figures from voltage, current and power factor — tariff and cost discussions
- Apply single-line diagram reading to trace supply routes and redundancy — procurement and contract scope
- Weigh reliability, cost and safety trade-offs in engineering options — executive committees
- Communicate outage causes and grid changes in plain language — customers and the public
- Build informed challenge questions for engineering proposals — project sponsors and boards

## Key Electrical Power Systems for Non-Engineers Terms

- Single-line diagram — a simplified drawing that shows how generators, transformers, lines and loads connect, using one line for three phases.
- Power factor — the ratio of useful power to apparent power, showing how efficiently a load draws current from the supply.
- Peak demand — the highest power drawn over a period, which drives the size and cost of network equipment.
- Technical losses — energy lost as heat in lines and transformers while electricity travels from plant to customer.
- Frequency — the number of alternating current cycles per second, held steady by matching generation to demand.
- N-1 security — a planning rule that the network keeps supplying customers if any single component fails.

## Electrical Power Systems for Non-Engineers Day by Day

## Day 1: Electricity Basics Without Equations

- Voltage, Current and Resistance Analogies — Intuition for Non-Technical Roles
- Power and Energy Units — Kilowatts Versus Kilowatt-Hours on Bills
- Alternating Versus Direct Current — Why Grids Use AC
- Three-Phase Supply Concept — Efficiency for Large Loads
- Electrical Safety Principles — Hazards Every Manager Should Respect

## Day 2: The Electricity Value Chain

- Generation, Transmission, Distribution and Retail — Roles and Revenue Flows
- Market Structures — Vertically Integrated Versus Unbundled Utilities
- System Operator Responsibilities — Balancing and Dispatch Decisions
- Customer Segments and Load Profiles — Residential, Commercial and Industrial
- Energy Transition Pressures — Renewables, Electrification and Storage

## Day 3: Power Generation Technologies

- Thermal Plants — Gas Turbines, Combined Cycle and Steam Units
- Solar and Wind Generation — Variability and Capacity Factor
- Hydro, Nuclear and Storage Options — Role in the Generation Mix
- Plant Cost Components — Capital, Fuel and Maintenance Shares
- Merit Order Dispatch — Which Plant Runs When

## Day 4: Transmission Networks

- High-Voltage Lines and Cables — Why Voltage Rises for Distance
- Substations and Power Transformers — Stepping Voltage Up and Down
- Interconnectors and Grid Meshing — Sharing Reserves Across Areas
- Transmission Losses and Congestion — Costs Hidden in the Network
- Right of Way and Environmental Constraints — Project Timeline Drivers

## Day 5: Distribution and Customer Connections

- Medium and Low Voltage Networks — Feeders, Ring Mains and Radials
- Connection Applications — Capacity Checks and Offer Terms
- Metering Types and Smart Meters — Data for Billing and Planning
- Non-Technical Losses — Theft, Meter Errors and Billing Gaps
- Rooftop Solar and Electric Vehicle Charging — New Customer Behaviours

## Day 6: Reading Single-Line Diagrams

- Standard Symbols — Generators, Transformers, Breakers and Busbars
- Tracing Supply Paths — From Source to Customer Load
- Redundancy Patterns — Single, Double and Ring Configurations
- Equipment Ratings on Drawings — Voltage, Capacity and Fault Level
- Diagram Walk-Through of a Substation — Questions to Ask Engineers

## Day 7: Reliability, Protection and Power Quality

- Outage Causes and Restoration Steps — Explaining Interruptions to Customers
- Reliability Indices — Frequency and Duration of Customer Interruptions
- Protective Devices in Plain Terms — Fuses, Breakers and Relays
- Voltage Dips, Harmonics and Flicker — Effects on Sensitive Customers
- Power Factor Correction — Penalties and Savings for Industrial Users

## Day 8: Grid Balancing and Operations

- Frequency Control Basics — Matching Supply and Demand Second by Second
- Reserves and Ancillary Services — Paying for Standby Capacity
- Demand Forecasting — Weather, Calendar and Economic Drivers
- Control Centre Functions — Monitoring, Switching and Emergency Response
- Renewable Variability Management — Storage and Flexible Demand Roles

## Day 9: Tariffs, Costs and Investment Decisions

- Tariff Components — Energy, Capacity, Network and Fixed Charges
- Cost of Supply Studies — Allocating Costs to Customer Classes
- Capital Project Business Cases — Reading Engineering Justifications
- Equipment Procurement Specifications — Ratings, Standards and Lead Times
- Life-Cycle Cost Versus Lowest Price — Tender Evaluation Choices

## Day 10: Practising the Technical Proposal Challenge Checklist

- Applying Value Chain Mapping — Placing a Live Proposal in Context
- Applying Single-Line Diagram Reading — Scope and Redundancy Questions
- Applying Reliability and Tariff Logic — Customer and Cost Impact Review
- Applying Procurement and Life-Cycle Tests — Specification Challenge Points
- Technical Proposal Challenge Checklist — Completed Question Set for Peer Review

## Applying Electrical Power Systems for Non-Engineers After the Course

- Take the next capital request for a substation, feeder or meter rollout and annotate its single-line diagram with the scope and redundancy questions taught.
- Rewrite one outage or tariff explanation used with customers in plain terms that link cause, restoration steps and cost.

## Electrical Power Systems for Non-Engineers Questions FAQ

### What are electrical power systems for non-engineers, and why do they matter now?

Electrical power systems for non-engineers is a plain-language explanation of how electricity is generated, moved, balanced and priced. It matters now because heavy grid investment and the energy transition put technical decisions before finance, commercial and procurement leaders.

### Which roles gain most from electrical power systems for non-engineers training?

Commercial, finance, procurement, legal and communications professionals in utilities and large energy users gain most. You benefit if you approve budgets, buy electrical equipment, set tariffs or explain outages and projects to customers.

### How does electrical power systems for non-engineers differ from an engineering power systems course?

An engineering power systems course teaches calculations, protection settings and design studies for engineers. This course keeps mathematics light and focuses on the questions non-engineers must ask, reading diagrams, tariffs and business cases to judge technical proposals.

## What do you bring back from electrical power systems for non-engineers training?

You bring back a structured question set for testing engineering proposals, covering scope, reliability, cost and procurement points. It helps you engage engineers confidently and approve or challenge the next request with clear reasons.

## Electrical Power Systems for Non-Engineers: The Way Forward

The Technical Proposal Challenge Checklist first informs whether the next engineering request goes to approval or back for clarification. Finance, procurement and commercial managers use it in capital and tender meetings. After its first use, revisit the energy transition questions it contains, since storage, rooftop solar and electric vehicles keep changing what grid proposals must address.