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COURSE BROCHURE

# Active Distribution Network Planning and Automation Training Course

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Abu Dhabi

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Registered in the United Kingdom and Saudi Arabia

# Active Distribution Network Planning and Automation Training Course

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Active Distribution Network Planning and Automation is a 1-week training course for distribution network engineers and planners who must prepare feeders for two-way power flow, and it ends with each participant drafting a Feeder Hosting Capacity and Automation Upgrade Plan. Rooftop solar, electric vehicle charging and customer batteries are changing load shapes faster than traditional reinforcement cycles allow. Jupiter Prime Training runs this course on Active Distribution Network Planning and Automation.

## Why Active Distribution Network Planning and Automation Matters Now

Three forces now shape low and medium voltage feeders: customers installing rooftop solar and home batteries, fleets and households adding electric vehicle chargers, and smart meters that finally reveal what happens beyond the substation. These create reverse power flow and sharp evening peaks on circuits sized for one-way demand. A utility that plans well connects customers quickly and defers reinforcement; one that does not faces voltage complaints and long connection queues. The course rests on established hosting capacity, feeder automation and voltage regulation practice.

## Who Gains Most from Active Distribution Network Planning and Automation

- Engineers who set connection limits for rooftop solar, chargers and storage on existing feeders
- Planners who forecast feeder loading and choose between reinforcement and flexible options
- Specialists who configure reclosers, sectionalisers and automated switching schemes
- Engineers who tune voltage regulators, tap changers and capacitor banks along long circuits
- Analysts who turn smart meter readings into feeder models and fault location evidence

A distribution planning section that sends planners, protection staff and control room engineers together gains most.

## Active Distribution Network Planning and Automation Capabilities

Participants judge how much new solar, charging and storage a feeder absorbs and which automation step lifts that limit.

- Calculate feeder hosting capacity for solar and charging connections — connection approvals
- Assess voltage rise and thermal limits under reverse power flow — reinforcement priorities
- Design a feeder automation layout with reclosers and remote switches — restoration targets

- Specify voltage regulation settings for regulators and smart inverters — customer supply quality
- Apply smart meter data to fault location and load profiling — field crew dispatch
- Weigh reinforcement against flexible connection and storage options — capital planning boards

## Key Active Distribution Network Planning and Automation Terms

- Hosting capacity — the amount of new generation or load a feeder can accept before voltage, thermal or protection limits are breached.
- Reverse power flow — power moving from customers back towards the substation when local generation exceeds local demand.
- Fault location, isolation and service restoration — an automated sequence that finds a faulted section, opens switches around it and restores healthy sections.
- Volt-var control — coordinated use of regulators, capacitors and inverter reactive power to hold feeder voltage within limits.
- Flexible connection — an agreement letting a customer connect sooner in exchange for curtailment during constraints.
- Recloser — a pole-mounted breaker that trips on a fault and recloses to clear temporary faults.

## Active Distribution Network Planning and Automation Day by Day

### Day 1: Feeders Under Two-Way Power Flow

- Rooftop Solar Growth Patterns — Midday Voltage Rise on Residential Feeders
- Electric Vehicle Charging Profiles — Evening Peak Loading on Transformers
- Customer Battery Behaviour — Smoothing or Sharpening Feeder Demand
- Smart Meter Data Streams — Visibility Beyond the Primary Substation
- Feeder Classification by Customer Mix — Choosing Where to Study First

### Day 2: Hosting Capacity and Load Forecasting

- Time-Series Feeder Modelling — Capturing Daily Generation and Demand Swings
- Hosting Capacity Study Methods — Setting Connection Limits per Feeder
- Thermal and Voltage Limit Checks — Identifying the Binding Constraint
- Charging Uptake Scenarios — Sizing Transformers for Future Fleets
- Hosting Capacity Maps — Publishing Connection Headroom to Customers

### Day 3: Voltage Regulation and Smart Inverters

- On-Load Tap Changer Settings — Balancing Light and Heavy Load Days
- Line Voltage Regulator Placement — Holding Voltage on Long Rural Circuits
- Switched Capacitor Bank Control — Reactive Support Without Overvoltage
- Inverter Volt-Var and Volt-Watt Functions — Customer Equipment as Network Support
- Coordinated Volt-Var Schemes — Avoiding Regulator and Inverter Hunting

## Day 4: Feeder Automation and Fault Location

- Recloser and Sectionaliser Coordination — Limiting Customers Affected per Fault
- Automated Isolation and Restoration Logic — Cutting Outage Minutes on Meshed Feeders
- Protection Under Bidirectional Fault Current — Avoiding Blinding and Sympathetic Trips
- Smart Meter Last-Gasp Alarms — Pinpointing Faulted Sections Faster
- Remote Switch Communications — Choosing Radio or Fibre Links

## Day 5: Practising the Upgrade Plan

- Feeder Hosting Study Rerun — Applying Day Two Limits to a Case Circuit
- Voltage Regulation Option Comparison — Testing Day Three Settings on the Case
- Automation Layout Draft — Placing Day Four Switches and Reclosers
- Reinforcement Versus Flexible Connection Costing — Ranking Upgrade Options
- Feeder Hosting Capacity and Automation Upgrade Plan — Final Recommendation

## Applying Active Distribution Network Planning and Automation After the Course

- Run a time-series hosting capacity study on one high-solar feeder and publish its headroom.
- Map smart meter last-gasp alarms against recent outages to find where automated switching shortens restoration.

## Active Distribution Network Planning and Automation Questions FAQ

### What is Active Distribution Network Planning and Automation and why does it matter now?

It is the practice of planning and controlling feeders that carry power both ways. Solar, charging and batteries now push feeders past their design limits, so planners need new studies and automated controls.

### Which roles gain most from Active Distribution Network Planning and Automation?

Distribution planners, connection engineers, protection and automation specialists and voltage regulation engineers gain most. You benefit most if you approve connections or set regulator and recloser settings.

### How does Active Distribution Network Planning and Automation differ from a transmission protection course?

It focuses on medium and low voltage feeders rather than high voltage grids. It deals with customer generation, charging loads, feeder switching and voltage on circuits reaching homes and businesses.

## What do you bring back from Active Distribution Network Planning and Automation?

You bring back a worked upgrade plan for a case feeder. It combines a hosting capacity result, regulation settings, an automation layout and ranked reinforcement options.

## Active Distribution Network Planning and Automation: The Way Forward

The Feeder Hosting Capacity and Automation Upgrade Plan first informs which feeders receive new connections without reinforcement. Connection engineers and control room staff use it to agree limits and switching priorities. After its first use, revisit the charging uptake scenarios, since depot and housing electrification can shift the binding constraint quickly.