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AI Applications for Electricity and Water Utilities Training Course

23 – 27 May 2027
Muscat

AI Applications for Electricity and Water Utilities Training Course

Ref: 65_1654 **Date:** 23 – 27 May 2027 **Location:** Muscat **Fees:** 6500 GBP

AI Applications for Electricity and Water Utilities is a 1-week training course for utility, grid operations, water network and asset managers, in which participants build a utility AI business case for one network or service area. Rooftop solar, electric vehicles, ageing pipes and tighter water budgets are changing how networks behave hour by hour, and machine learning now shapes how quickly a utility sees losses and outages. The course is delivered by Jupiter Prime Training.

Why AI Applications for Electricity and Water Utilities Matters Now

Three forces are reshaping utility networks. Distributed generation, storage and electric vehicle charging make electricity demand less predictable feeder by feeder; ageing water mains and scarce supply make non-revenue water a board-level concern; and customers and regulators expect fewer interruptions, faster restoration and accurate bills. A utility that applies machine learning well forecasts load with confidence, finds leaks and theft sooner and targets capital at the assets most likely to fail. One that applies it badly buys analytics that operators distrust. Model oversight follows ISO/IEC 42001 AI management systems and the NIST AI Risk Management Framework NIST AI RMF.

Who Gains Most from AI Applications for Electricity and Water Utilities

- Managers responsible for control room operations, switching and outage restoration
- Managers who run water distribution, pressure zones and leakage reduction
- Managers accountable for network asset investment and renewal plans
- Managers who own metering, billing accuracy and revenue protection
- Managers who lead utility digital transformation and data platforms

A utility gains most when its network operations, asset and customer service managers attend together, because a single smart meter stream feeds forecasting, loss detection and billing decisions at once.

AI Applications for Electricity and Water Utilities Capabilities

Participants leave able to rank machine learning use cases across both wires and pipes, and to argue for the ones that change network performance and customer outcomes.

- Assess smart meter, SCADA and GIS data for forecasting and loss detection readiness — utility data platform owners
- Weigh statistical and machine learning demand forecasts at system and feeder level — network planners
- Apply anomaly detection to district metered area flows and night-time minimums — leakage managers
- Design an outage prediction approach linking weather, vegetation and asset age — control room supervisors
- Calculate asset health and criticality scores for renewal ranking — capital investment committees
- Build a utility AI business case with operational and customer measures — executive and regulatory affairs teams

Key AI Applications for Electricity and Water Utilities Terms

- Non-revenue water — water produced but not billed, through physical leaks, meter error or unauthorised use.
- District metered area — a section of a water network with measured inflows, used to locate and size leakage.
- Advanced metering infrastructure AMI — smart meters and communication networks that report consumption at short intervals.
- Distributed energy resources — small generation and storage, such as rooftop solar and batteries, connected within the distribution network.
- Asset health index — a score combining condition, age and performance data to show how close an asset is to failure.
- Revenue protection — detecting meter tampering, theft and billing errors that reduce a utility's collected income.

AI Applications for Electricity and Water Utilities Day by Day

Day 1: Utility Networks Under Pressure

- Distributed Energy Resources and Electric Vehicle Charging — Feeder Demand Uncertainty
- Non-Revenue Water Balance — Physical Versus Commercial Loss Priorities
- Utility Data Landscape: AMI, SCADA, GIS and Billing — Integration Choices
- Service Reliability Indices and Customer Expectations — Performance Targets
- Utility AI Maturity Assessment — Starting Points for Electricity and Water

Day 2: Forecasting Demand and Balancing Networks

- Short-Term System Load Forecasting — Generation Dispatch and Reserve Decisions
- Water Demand Forecasting by Zone — Pumping Schedules and Reservoir Levels
- Solar and Wind Output Forecasting — Grid Balancing and Curtailment
- Demand Response and Flexibility Analytics — Peak Reduction Programmes for Customers
- Pump and Treatment Energy Optimisation — Water Utility Cost Control

Day 3: Detecting Losses, Leaks and Outages

- District Metered Area Flow Anomaly Detection — Leak Location Priorities
- Acoustic and Pressure Transient Analytics — Burst Detection in Trunk Mains
- Outage Prediction From Weather and Vegetation Data — Crew Pre-Positioning
- Fault Location and Restoration Analytics — Switching Sequence Decisions
- Meter Tampering and Theft Detection — Revenue Protection Targeting

Day 4: Assets, Customers and Model Oversight

- Asset Health Index and Criticality Scoring — Pipe and Cable Renewal Ranking
- Smart Meter Consumption Segmentation — Tariff Design and Customer Insight
- Billing Exception Detection — Complaint Reduction and Collection Accuracy
- Generative AI for Customer Contact Centres — Outage and Bill Enquiries
- ISO/IEC 42001 and NIST AI RMF — Oversight of Operational Utility Models

Day 5: Practising the Utility AI Business Case

- Use-Case Prioritisation Across Electricity and Water — Reliability and Loss Impact
- Data and Platform Requirements Sheet — AMI, SCADA and GIS Readiness
- Operator Trust and Control Room Change — Human Override Rules
- Benefit Measures: Restoration Time, Water Loss and Bill Accuracy — Tracking
- Utility AI Business Case — Costs, Benefits, Risks and Rollout Stages

Applying AI Applications for Electricity and Water Utilities After the Course

- Run a night-flow anomaly test on three district metered areas using existing logger data and compare flagged zones with recent leak repairs.
- Back-test a machine learning feeder load forecast against the current planning method for one season of smart meter and SCADA data.

AI Applications for Electricity and Water Utilities Questions FAQ

What are AI applications for electricity and water utilities, and why do they matter now?

They are machine learning uses that forecast demand, detect leaks and outages, score asset health and improve billing. They matter now because distributed energy, ageing pipes and customer expectations are changing networks faster than manual methods can follow.

Which roles gain most from AI applications for electricity and water utilities?

Control room, water distribution, asset investment, metering and digital transformation managers gain most. You learn to rank use cases across both networks and to agree the data each one needs from shared metering and SCADA platforms.

How do AI applications for electricity and water utilities differ from an AI course for electrical engineers?

They work at network and service level. Instead of single-asset sensor design, you deal with feeder forecasts, district metered areas, outage prediction, revenue protection and the business case a utility board needs before funding analytics.

What do you bring back from AI applications for electricity and water utilities?

You bring back a business case for one network or service area. It ranks use cases, lists data and platform needs, sets benefit measures for reliability, water loss and billing, and stages the rollout.

AI Applications for Electricity and Water Utilities: The Way Forward

The utility AI business case first informs which use case, such as leakage detection or feeder forecasting, receives funding and data access. Operations, asset and customer service managers use it to agree owners and benefit measures. After the first quarter of live results, revisit operator trust and override rates, because they show whether the control room will act on model outputs at scale.