Utility Network Operations Training Course: Demand Forecasting, Loss Detection and Outage Response

4 – 8 April 2027
Amman

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Programme Summary

Utility network operations are the subject of this one-week training course for operations, network, planning and customer service leaders in utilities, ending in a network AI use case portfolio for one operating area. Utilities hold large volumes of meter and sensor data, yet forecasting, loss detection and outage handling often rely on manual review and unchecked tools. The programme shows how to select use cases, test them against operating data, set decision rules and govern their use, applied to an area the participant selects. Mars Training Centre UK delivers this programme on utility network operations to mixed-organisation cohorts.

The Business Case

Utility network operations carry fixed service duties, so forecasting misses, undetected leaks and slow outage responses reach customers. Artificial intelligence can support each task, but weak data, opaque models and alerts nobody owns raise cost and erode trust. Leaders who judge evidence, set clear decision rules and assign ownership adopt AI in smaller, safer steps.

- Forecast Error: Falls as models are tested against recent demand patterns before use.
- Network Losses: Fall as detection alerts are ranked and sent to field teams with clear ownership.
- Outage Restoration Time: Falls as incident information is combined and prioritised faster.

Principles and Evidence Base

- ISO 55001: The international asset management system standard frames how AI use cases are linked to asset decisions and accountability in Sessions 1 and 4.
- Time Series Forecasting: Session 2 applies its handling of trend, seasonality and error to demand models.
- Signal Detection Theory: Session 3 uses the trade-off between missed events and false alarms to set loss and leak alert thresholds.
- Data Minimisation: The principle of collecting only the data a purpose needs guides the customer data checks in Session 4.

Intended Participants

- Operations leaders who run network control and field response.
- Network planners who forecast demand and plan capacity.
- Loss and leakage managers who rank and investigate network losses.
- Customer service leaders who handle outage information and enquiries.
- Data and technology leads who supply and govern utility data.

Typical sectors include electricity distribution, water supply and gas networks.

Learning Outcomes

1. Participants will be able to prioritise AI use cases by value, data readiness and operating risk.
2. Participants will be able to evaluate demand forecasting models against recent demand patterns.
3. Participants will be able to diagnose weaknesses in network loss and leak detection alerts.
4. Participants will be able to design outage and incident response rules that combine alerts with field information.
5. Participants will be able to justify customer communication and data protection measures for AI tools.
6. Participants will be able to construct a governed adoption plan for one operating area.

Programme Structure

Day 1: Utility Network Operations and AI Use Cases

Where can AI support utility network operations, and where is the data not ready?

- Operating Decision Map
- Meter and Sensor Data Inventory
- Use Case Scoring Grid
- Data Readiness Checklist
- ISO 55001 Asset Decision Link

Day 2: Demand Forecasting

How is a demand forecast built, tested and trusted for planning and operation?

- Demand Pattern Review
- Forecast Model Comparison Sheet
- Error Measure Table
- Weather and Event Driver List
- Forecast Use Rules

Day 3: Network Loss and Leak Detection

How are losses found, ranked and sent to the right field team?

- Loss Pattern Analysis
- Anomaly Alert Threshold Sheet
- False Alarm and Missed Event Trade-Off
- Field Dispatch Priority Matrix
- Alert Review Log

Day 4: Outage Response, Customers and Governance

How are outages handled, customers informed and tools kept under control?

- Outage Information Flow Map
- Incident Priority Rules
- Customer Contact Script Review
- Customer Data Privacy Screen
- Model Ownership and Oversight Register

Day 5: Applying the Tools to One Operating Area

Do the use case, forecast, detection and governance tools hold together for one area?

- Applying the Session 1 Use Case Scoring Grid
- Testing the Session 2 Forecast Use Rules
- Tuning the Session 3 Anomaly Alert Threshold Sheet
- Checking the Session 4 Model Ownership and Oversight Register
- Completing the Network AI Use Case Portfolio

Methodology

The programme uses a data workshop method built on anonymised demand series, flow and pressure readings, outage logs and customer contact records. Participants work in mixed operations and planning teams on one shared area, challenge each other's thresholds, and receive written facilitator feedback on each exercise.

- Suggested activity: Comparing two demand forecasts against a held-back week of readings.
- Suggested activity: Setting a leak alert threshold and ranking the resulting alerts for dispatch.
- Suggested activity: Drafting outage priority rules for a storm scenario.

Capstone Output

Each participant completes a network AI use case portfolio for one operating area. It holds a scored list of use cases, a data readiness note, forecast and alert rules, an incident priority table, customer data safeguards and an ownership register. The portfolio is used at work to brief executives and plan the first pilot.

Frequently Asked Questions

Is utility network operations training suitable for leaders without a data science background?

Yes. Utility network operations are taught through cases and checklists, so the programme assumes operating or planning experience but no coding.

Which standard does utility network operations training draw on?

Utility network operations training draws on ISO 55001 for linking AI use cases to asset decisions, alongside time series forecasting, signal detection theory and data minimisation.

How is the portfolio from utility network operations training used at work?

You use the network AI use case portfolio to brief executives, question suppliers on evidence and plan a first pilot in one operating area.

How does utility network operations differ from smart grid investment training?

Utility network operations centre on daily forecasting, loss detection and outage decisions, while smart grid investment training centres on capital planning for grid technology.