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COURSE BROCHURE

# AI and Smart Technologies in Water Systems Training Course

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New York

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Registered in the United Kingdom and Saudi Arabia

# AI and Smart Technologies in Water Systems Training Course

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AI and Smart Technologies in Water Systems is a 1-week training course for water utility managers, network and treatment engineers and asset and operations leads, who leave with a smart water AI roadmap for their utility. Ageing pipes, energy bills and quality expectations push utilities to read sensor data rather than react to bursts. Jupiter Prime Training runs this course on AI and smart technologies in water systems for those who keep water flowing.

## Why AI and Smart Technologies in Water Systems Matter Now

Three forces shape AI and smart technologies in water systems today: non-revenue water lost through leaks that crews find too late, pumping and aeration that consume a large share of a utility's energy, and customers who expect safe water and quick answers when quality dips. Utilities that use meters, pressure loggers and models well cut losses, flatten energy peaks and catch contamination early; those that do not keep digging blind and paying for water that never reaches a tap. Examples come from municipal drinking water distribution and wastewater treatment. Model risk is treated with ISO/IEC 42001 for AI management systems and the NIST AI Risk Management Framework AI RMF.

## Who Gains Most from AI and Smart Technologies in Water Systems

- Network managers responsible for pressure, bursts and non-revenue water reduction
- Treatment plant engineers who run dosing, filtration, aeration and sludge processes
- Asset managers who plan pipe renewal, pump overhauls and capital budgets
- Operations and control room leads who run SCADA systems and dispatch field crews
- Water quality leads accountable for sampling, compliance reporting and incident response

The strongest gain comes when a network manager, a treatment engineer and an asset manager from one utility attend together.

## AI and Smart Technologies in Water Systems Capabilities

Participants learn to connect meters, loggers, SCADA tags and models so a utility sees losses, energy and quality in one picture.

- Assess sensor, SCADA and smart meter data for model readiness — utility digital leads
- Apply acoustic and pressure analytics to locate leaks and bursts — network managers
- Calculate demand forecasts that shape storage, pumping and tariff planning — planning engineers
- Design pump scheduling that cuts energy cost while holding pressure targets — operations leads
- Specify real-time water quality alerts for treatment and distribution — quality managers
- Build a smart water AI roadmap with priorities, owners and measures — utility executives

## Key AI and Smart Technologies in Water Systems Terms

- Non-Revenue Water — water produced but not billed, through leaks, bursts, metering errors or unauthorised use.
- District Metered Area — a section of the network with measured inflows and outflows used to spot losses quickly.
- SCADA — supervisory control and data acquisition systems that monitor and control pumps, valves, reservoirs and treatment units.
- Digital Twin — a live hydraulic and process model of the network or plant, fed by sensor readings to test scenarios.
- Demand Forecasting — predicting hourly, daily and seasonal water use from history, weather and customer patterns.
- Soft Sensor — a model that estimates a hard-to-measure quality parameter from readings that are easier to collect.

## AI and Smart Technologies in Water Systems Day by Day

### Day 1: Water Utility Data and Pressures

- Water Cycle From Source to Tap and Back — Decisions Data Can Inform
- SCADA, Smart Meters and IoT Loggers — Data Sources and Gaps
- Data Quality, Time Stamps and Tag Naming — Model Readiness Checks
- Non-Revenue Water and Energy Baselines — Setting Improvement Targets
- Use Case Prioritisation for Utilities — Value, Effort and Risk

### Day 2: Leak Detection and Network Performance

- District Metered Areas and Minimum Night Flow — Loss Localisation
- Acoustic and Pressure Transient Analytics — Burst Detection Decisions
- Anomaly Detection on Flow and Pressure Data — Crew Dispatch Priorities
- Pressure Management Zones — Balancing Service Levels and Leakage
- Pipe Failure Prediction Models — Mains Renewal Ranking

### Day 3: Demand, Pumping and Energy

- Demand Forecasting With Weather and Calendar Effects — Storage Planning
- Hydraulic Digital Twins — Testing Network Scenarios Before Change
- Pump Scheduling Optimisation — Energy Tariffs and Pressure Targets
- Predictive Maintenance for Pumps and Motors — Overhaul Timing
- Reservoir Level and Transfer Planning — Supply Resilience Choices

### Day 4: Treatment and Water Quality Intelligence

- Coagulant and Chlorine Dosing Models — Chemical Use and Safety
- Aeration Control in Wastewater Treatment — Energy and Effluent Quality
- Soft Sensors and Online Quality Monitoring — Early Contamination Alerts
- Cyber Security for Connected Water Assets — Operational Technology Protection
- ISO/IEC 42001 and NIST AI RMF Controls — Utility Model Oversight

## Day 5: Practising the Smart Water AI Roadmap

- Utility Profile and Priority Decisions — Applying Use Case Prioritisation
- Network Losses Approach — Applying Leak and Pressure Analytics
- Pumping and Treatment Approach — Applying Energy and Quality Models
- Investment, Skills and Benefit Measures — Sequencing Initiatives
- Smart Water AI Roadmap — Presentation to Utility Leadership

## Applying AI and Smart Technologies in Water Systems After the Course

- Calculate minimum night flow for three district metered areas and rank them for active leak detection
- Compare one month of pump energy use against tariff periods and propose a revised pumping schedule

## AI and Smart Technologies in Water Systems Questions FAQ

### What are AI and smart technologies in water systems and why do they matter now?

AI and smart technologies in water systems combine sensors, meters, SCADA data and models to manage networks and treatment plants. They matter now because leakage, energy costs and quality expectations all rise while budgets for new assets stay tight.

### Which roles gain most from AI and smart technologies in water systems training?

Network managers, treatment engineers, asset managers, control room leads and water quality leads gain most. They decide where crews dig, how pumps run and when treatment changes, and models sharpen each of those choices.

### How does AI and smart technologies in water systems training differ from a general smart cities course?

It stays inside the utility rather than across city services. You work with district metered areas, pump schedules, dosing models and quality sensors instead of transport, lighting or citizen platforms.

### What do you bring back from AI and smart technologies in water systems training?

You bring back a roadmap for your utility. It ranks loss, energy and quality initiatives, names data needs and owners, and sets the measures that show whether each initiative works.

## AI and Smart Technologies in Water Systems: The Way Forward

The smart water AI roadmap first informs where the utility invests in sensors and models, whether leakage, pumping energy or treatment quality. Network, treatment and asset managers use it to agree priorities and owners. After the first season of results, revisit the demand and failure models, since consumption patterns and pipe behaviour shift with weather and growth.