



District Cooling Operations Training: Plant, Thermal Storage, ETS and Tariffs



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Introduction:

District cooling operations training on plant, thermal storage, ETS and tariffs is a 10-day course for district cooling utility engineers, network staff and customer connection teams, ending with a District Cooling Network Operations and Tariff Plan. Schemes lose capacity and revenue when chiller trains run out of merit order, tanks charge at the wrong hours, low return temperatures strand plant and connection charges miss network costs. Nominees already operate, connect or bill district cooling customers and work through modelling builds on plant logs, hydraulics, meter data and tariffs. CoreConcept Training Center delivers this district cooling operations course.

Course Objectives:

- Dispatch chiller trains, distribution pumps and thermal energy storage against hourly load forecasts and time-of-use electricity prices
- Analyse chilled water network hydraulics, pressure zones and pumping energy to set differential pressure and supply temperature setpoints
- Specify, commission and audit energy transfer stations at customer buildings so they hold the contracted return temperature
- Diagnose low delta-T across the network from meter and ETS data and agree correction actions with customers
- Manage condenser make-up water from treated sewage effluent and other non-potable sources within water quality limits
- Build capacity and consumption tariffs and connection charges that recover plant, storage and network costs

Target Audience:

- Plant engineers responsible for chiller train dispatch, thermal storage charging and plant efficiency in district cooling utilities
 - Network engineers responsible for buried chilled water pipework, pumping stations and pressure management
 - Customer connection engineers responsible for energy transfer station design review, commissioning and handover
 - Master-developer utility staff responsible for cooling load planning, plot connections and service agreements with the utility
 - Commercial and billing staff responsible for meter data, tariff application and connection charge calculation
 - Water and chemistry staff responsible for condenser make-up sources and treated effluent quality
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Course Outline:

Day 1: District Cooling Scheme Anatomy and Utility Business Model

- District Cooling Value Chain From Central Plant to Building
- Refrigeration Ton and Ton-Hour Units for Utility Accounting
- Diversity Factor Analysis Across Residential, Office and Retail Loads
- Load Duration Curve Construction From Hourly Cooling Demand
- Utility Baseline Register of Plants, Networks and Customers

Day 2: Central Plant Configuration and Chiller Train Arrangements

- Series-Counterflow Chiller Train Layout for Wide Temperature Lift
- Electric Centrifugal Versus Absorption Chiller Mix Selection
- Plant Heat Balance Method for Condenser Circuit Sizing
- N+1 Redundancy Assessment for Firm Plant Capacity
- Phased Plant Build-Out Plan Matching Connected Load Growth

Day 3: Thermal Energy Storage Design and Dispatch

- Stratified Chilled Water Tank Thermocline and Diffuser Design
- Ice Thermal Storage Charging Cycles and Melt-Out Rates
- Full Storage Versus Partial Storage Load Shifting Strategies
- Time-of-Use Tariff Analysis for Overnight Tank Charging
- Storage Figure of Merit Test for Tank Performance

Day 4: Chilled Water Distribution Networks and Pumping Data

- Pre-Insulated Buried Pipe Systems and Leak Detection Wires
- Hydraulic Network Model Build With Pressure Zone Mapping
- Critical Path Differential Pressure Setpoint Selection
- Distribution Pump Station Staging and Variable Speed Control
- SCADA Trend Tags for Network Flow, Pressure and Temperature

Day 5: Week One Modelling Build on a Case District Scheme

- Case Scheme Brief With Hourly Load and Plant Data
 - Case Chiller Train Merit Order and Dispatch Schedule
 - Case Storage Charging Plan Against Electricity Price Bands
 - Case Network Hydraulic Check at Peak and Shoulder Loads
 - Week One Plant and Network Model Review
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Day 6: Energy Transfer Stations and the Customer Interface

- Energy Transfer Station Plate Heat Exchanger Selection
- ETS Control Valve Sizing and Return Temperature Limiting
- Direct Versus Indirect Building Connection Design Choices
- ETS Commissioning Checklist and Customer Handover File
- Building Secondary Loop Survey Before Plot Connection

Day 7: Low Delta-T Syndrome, Make-Up Water and Operating Risk

- Low Delta-T Root Cause Tree for Customer Buildings
- Return Temperature Penalty Clauses in Customer Service Agreements
- Treated Sewage Effluent Make-Up Water Quality Limits
- TSE Side-Stream Filtration and Biofouling Control Programme
- Plant Outage Risk Register and Emergency Cooling Contingency

Day 8: Customer Connections, Developers and Service Agreements

- Cooling Load Application Review for New Plot Connections
- Contracted Capacity Negotiation With Master Developers and Owners
- Customer Service Agreement Structure and Performance Obligations
- Connection Charge Calculation From Network Extension Costs
- Customer Communication Plan for Planned Outages and Curtailment

Day 9: Metering, Tariff Structures, KPIs and Benchmarking

- Thermal Energy Meter Accuracy Checks and Data Validation
- Capacity Charge and Consumption Charge Tariff Build
- Fuel and Electricity Pass-Through Indexation Formulas
- Plant kW per Ton and Network Loss KPIs
- Utility Benchmarking Dashboard for Water, Power and Delta-T

Day 10: Capstone Modelling Build of the Network Operations and Tariff Plan

- Case Scheme Dispatch and Storage Schedule Finalisation
 - Case ETS Audit Findings and Delta-T Recovery Actions
 - Case TSE Make-Up Water Balance and Treatment Plan
 - Case Tariff and Connection Charge Model Testing
 - District Cooling Network Operations and Tariff Plan Presentation
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Skills You Will Gain:

- Chiller Train Dispatch
- Thermal Storage Scheduling
- Network Hydraulic Modelling
- Energy Transfer Station Auditing
- Delta-T Recovery
- Non-Potable Make-Up Water Management
- Thermal Energy Metering
- District Cooling Tariff Design

Why Attend This Course:

- Deliver a District Cooling Network Operations and Tariff Plan to the head of utility operations and the commercial lead for approval
- Decide which chiller trains, storage tanks and pumps run each hour, and which customer buildings need ETS correction
- Avoid stranded plant capacity, excess pumping power and connection charges that fail to recover network extension costs
- Coach shift operators, connection engineers and billing staff with the dispatch schedule, ETS audit checklist and tariff model

Conclusion:

Back at work, the participant presents the District Cooling Network Operations and Tariff Plan to the head of utility operations, the commercial lead and the master-developer utility team. Management uses it to set the daily dispatch order for chiller trains and storage, agree return temperature targets and ETS corrections with customers, confirm make-up water sources and approve capacity, consumption and connection charges. After the first peak cooling season under the plan, the utility should compare plant kW per ton, network delta-T, make-up water use and revenue recovery with the plan and revise the measures that fell short.

Frequently Asked Questions FAQ:

What should participants know before district cooling operations training on plant, thermal storage, ETS and tariffs?

Participants should already work on a district cooling plant, network, customer connection or billing team and be able to read chilled water trend logs and a basic tariff sheet. Anonymised plant logs, meter data or a customer agreement help during the modelling build days.

How does district cooling operations training differ from a building chiller plant course?

A building chiller plant course centres on chillers, pumps and controls inside one building. This course covers the utility: chiller trains serving many customers, thermal storage dispatch, buried networks, energy transfer stations, make-up water sources, metering and the tariffs that recover the investment.

Why does low delta-T matter so much in district cooling operations?

Low delta-T forces the utility to pump more water for the same cooling, so chillers and pipes reach their flow limits before their capacity limits. Capacity is stranded, pumping power rises and extra machines start, which is why customer agreements often set return temperature targets.

What do participants take back from district cooling operations training?

Participants take back a District Cooling Network Operations and Tariff Plan with a chiller train and storage dispatch schedule, an ETS audit checklist, delta-T recovery actions, a make-up water balance and a capacity, consumption and connection charge model.
