International Office for Water

Capacity building for better water management

Professional training

All our training programmes

CNFME FRENCH NATIONAL WATER TRAINING CENTRE
Capacity building for better water management

**WATER IN THE CITY**

- Introduction to the profession
- Water quality and analyses
- Drinking water production
- Drinking water supply
- Laying out and rehabilitation of water supply systems
- Sanitation systems
- Urban wastewater treatment
- Waste and sludge treatment
- On-site sanitation
- Boreholes
- Pumping
- Maintenance, electrical engineering
- Automation and remote management
- Metrology

**WATER IN NATURAL ENVIRONMENTS**

- Groundwater
- Rivers
- Water uses
- Monitoring

**WATER IN INDUSTRY**

- Management, analyses and controls
- Process water
- Treatment of industrial wastewater
- Decontamination by surface treatment

**MANAGEMENT OF UTILITIES**

- Management of water supply and sanitation utilities
- Safety of the personnel

**WEB-TRAINING**

- From your office, have access to training programmes taught by experts

Training all along the water cycle ...
WATER IN THE CITY

INTRODUCTION TO THE PROFESSION
Drinking water supply and sanitation: introduction to the profession
Initiation to water supply
Initiation to drinking water treatment
Initiation to sewerage: sewer system and wastewater treatment plant
Initiation to the operation of sewer systems
Basics of hydrogeology

WATER QUALITY AND ANALYSES
Initiation
Basics of water chemistry
Understanding of chemical reactions in water treatment systems
Drinking water
Drinking water analyses for self-monitoring
Risk analysis in drinking water production and supply
Tastes and odours of drinking water
Wastewater
Wastewater analyses for self-monitoring
Validity and reliability of industrial wastewater analyses
Bacteriology
Elementary analyses related to water bacteriology - Module 1
Analyses related to water bacteriology - Module 2
New methods for assessing bacterial flora
Sampling
Water sampling: Why? How?
Toxicity
Toxicity - Ecotoxicity
Biomonitroing of discharges
Hygiene and safety
Analysis laboratory: hygiene and safety
Quality and data management
Format for exchanging data between laboratories and clients
Metrology applied in laboratories
Uncertainties in quantitative measurements
Measurement uncertainties and validation by microbiology

DRINKING WATER PRODUCTION
Initiation
Initiation to drinking water production
Operation of drinking water production plants - Level 1
Operation
Operation of drinking water production plants - Level 2
Water disinfection
Ozone in water treatment: principle and application
Operation of drinking water production plants - Level 3
Operation of a water disinfection centre using chlorine and chlorine dioxide
Microscopic observation of freshwater microalgae
Means for fighting against algae and their pollution
Reagents in drinking water treatment: application and safety
Correction of the mineralisation of corrosive waters: neutralisation and remineralisation of water
Correction of the mineralisation of scaling waters
Swimming pools
Water treatment and control in swimming pools
Treatment techniques
Drinking water treatment processes
Water refining: membrane process, activated carbon
Membrane filtration in drinking water treatment: microfiltration (MF)
UF - nanofiltration (NF) - reverse osmosis (RO)
Sea water desalination
Individual treatment
Water treatment at the place of use
DRINKING WATER SUPPLY

- **Design, sizing**
  - Hydraulic study: basics of applied hydraulics - Level 1
  - Hydraulic study: pumping and supply - Level 2
  - Hydraulic study: pumping and supply - Level 3
  - Diagnostics and modelling of drinking water supply systems

- **Operation**
  - Regulatory evolutions and techniques in water supply
  - Operation of drinking water supply systems - Module 1
  - Operation of drinking water supply systems - Module 2
  - Reading and exploitation of system plans
  - Water meters
  - Management of meters
  - Instrumentation of a drinking water supply system
  - Hydraulic regulation valves
  - Hydraulic control valves - Level 1
  - Hydraulic control valves - Level 2
  - Installation and maintenance of fire hydrants and post hydrants
  - Cleaning and disinfection of drinking water works
  - Maintenance of water quality in supply systems

- **Leak detection**
  - Improvement of the system yield: strategy and organisation
  - Detection of leaks and buried pipes

- **Patrimonial management**
  - Diagnostics of drinking water supply: small and average communities
  - Management of assets: renewal and rehabilitation of the water supply system
  - Rehabilitation of drinking water tanks
  - Building of concrete units

- **Domestic system and health protection**
  - Preparation of the qualification to the maintenance of backflow preventers
  - Qualification to the maintenance of backflow preventers
  - Qualification to the maintenance of backflow preventers – compensatory training course
  - Renewal of the qualification to the maintenance of backflow preventers
  - Technical and health rules in domestic systems
  - Control of domestic water systems supplied by another water resource
  - Use of rain water at the plot

LAYING OUT AND REHABILITATION OF WATER SUPPLY SYSTEMS

- **Drinking water**
  - Construction of DWS systems
  - Construction of the systems without trenching
  - Laying out of drinking water pipelines
  - Qualification to the electrical welding of the polyethylene pipe
  - Qualification to the butt welding of polyethylene pipes

- **Sanitation**
  - Definition of the construction project - Module 1
  - Drafting of special technical specifications - Module 2
  - Soil study for the laying out of systems
  - Implementation and follow-up of sanitation working sites - Module 3
  - Rehabilitation of non-inspectable sanitation systems
  - Construction of systems without trenching
  - Patrimonial management of inspectable sanitation systems and appurtenances

- **Working sites**
  - Inspection and testing of sewerage systems
  - Implementation and control of trench filling-up
  - Risk prevention on main laying sites
  - Marking of working sites
  - Temporary signalling of working sites
SANITATION SYSTEMS

**Design, sizing**
- Management of urban discharges in rainy weather
- Water law section for storm drainage developments
- Sizing of sanitation systems - Level 1
- Sizing of sanitation systems - Level 2
- Urban hydrology and calculation of a storm drainage system - Level 1
- Urban hydrology: modelling of systems - Level 2
- Alternative techniques: design and sizing
- Storm water retention reservoir: design, sizing and maintenance
- Storm water overflows: design, sizing and operation
- Rain water treatment
- Integration of installations into the landscape with a sustainable development approach

**Operation**
- Regulatory evolutions and sanitation techniques
- Safety of the personnel working in sewerage systems
- Work in confined space in sewerage systems
- Initiation to the operation of sanitation systems
- Operation of sanitation systems - Module 1
- Operation of sanitation systems - Module 2
- Flushing of sewers and sanitation works
- Knowledge and operation of oil/water separators
- Levelling in sanitation systems

**Control**
- Development and control of branching-offs from the sewerage system
- Leak rate testing in sewerage systems
- Self-monitoring of sewerage systems: validation and use of measurements
- Self-monitoring of sewerage systems: implementation
- Visual inspection of sewerage systems: acceptance of new work and control of existing works - Level 1
- Visual inspection of sewerage systems: acceptance of new work and control of existing works - Level 2
- Visual inspection of sewerage systems: specifications and application in patrimonial management

**Diagnostics and strategy**
- Diagnostics of sewerage systems and master plan

URBAN WASTEWATER TREATMENT

**Operation**
- Operation of a wastewater treatment plant - Level 1
- Safety and hygiene in a wastewater treatment plant
- Operation of wastewater treatment plants for small communities
- Activated sludge - Level 2: measurements and diagnostics
- Activated sludge - Level 2: adjustments
- Microscopic observation of the separator biomass
- Activated sludge - Level 3: malfunction
- Technical management of a wastewater treatment plant
- Nitrification, denitrification and phosphate removal
- ISO-14001 certification of sanitation systems
- Operation of a physico-chemical wastewater treatment plant
- Operation of membrane bioreactors
- Operation of biofilters and desodorisation

**Design**
- Hydraulics applied to the design and sizing of wastewater treatment plants
- Civil engineering in wastewater treatment plants
- Design and sizing - Module 1: wastewater treatment plant using activated sludge on a separate system
- Design and sizing - Module 2: wastewater treatment plant using activated sludge on a combined system
- Design and sizing - Module 3: treatment for small communities
- Design and sizing - Module 4: compact treatment processes
- Participation in the technical acceptance of a wastewater treatment plant using activated sludge

**Quality control**
- Implementation of self-monitoring of wastewater treatment plants in small communities
- Operation and maintenance of a self-monitoring system in a wastewater treatment plant
WASTE AND SLUDGE TREATMENT
Treatment processes and re-use of sludge from wastewater treatment plants
Operation of sludge dewatering systems
Digestion of sludge from wastewater treatment plants
Sludge re-use in agriculture: regulation, responsibilities and implementation
Treatment of sanitation by-products (sludge from wastewater treatment plants not included)

ON-SITE SANITATION
Microscopic observation of sludge and biomass from septic tanks
Maintenance of on-site sanitation systems?: role of the community?
Design, sizing and installation of on-site sanitation systems
Management of on-site sanitation utilities
Diagnostics of sanitation during real estate transactions
Management of on-site sanitation: rehabilitation without litigation
On-site sanitation for the contractor: technical and regulatory bases
Technical control of existing on-site sanitation systems
Technical control of new on-site sanitation systems: design and diagnostics of good working order

BOREHOLES
Protection of drinking water abstraction areas
Boreholes
Controls by the prime contractor - boreholes
Diagnostics, ageing and rehabilitation of a borehole

PUMPING
Choice and installation of a pump
Pumping stations in sewerage systems
Water booster pumps: operation and sizing
Operation and maintenance of a submerged pump
Pumping tests on boreholes
Design of pumping stations: Module 1 - civil engineering
Design of pumping stations: Module 2 - hydraulic operation

MAINTENANCE, ELECTRICAL ENGINEERING, AUTOMATION AND REMOTE MANAGEMENT
Maintenance
Maintenance of current mechanical equipment in wastewater treatment plants
Maintenance of pumping stations
Maintenance of electric installations
Operation and maintenance of industrial programmable logic controllers
Use and adjustment of control loops

Electro-technical engineering
Awareness to the electrical environment
Understanding and operating electric installations in water production plants
Operation and maintenance of electronic starters and speed variators
Programming of industrial automata: initiation
Programming of industrial automata: improvement
Optimisation of energy consumption in plants
Quality of electric power: stakes, diagnostics and solutions
Acceptance of electric installations and automated systems
Industrial networks and programmable logic controllers

Remote management
How to use remote management equipment - Initiation
Development and maintenance of the new remote management tools

Renewable energies
Strategy for the use of renewable energies in water production plants
Operation and maintenance of production systems using renewable energies

METROLOGY
Flow metering, water level metering - Level 1
Flow metering, pluviometry and sampling - Level 2
Operation and maintenance of measurement chains
Metrology in plants and systems
Operation and maintenance of water quality sensors
River hydrometry: the gauger’s job
MANAGEMENT OF UTILITIES

MANAGEMENT OF WATER SUPPLY AND SANITATION UTILITIES

Regulations
Management of utilities: regulatory and legislative background
Water and urban planning procedures

Governance of utilities
Administrative and financial management of utilities
Sizing and organisation of a water supply utility
Sizing and organisation of a sanitation utility
Financial management of public water authorities
Method for delegating public services
Control of the delegating of public services
Performance indicators for water supply utilities
Performance indicators for sanitation utilities
ISO-9001 certification of water supply and sanitation utilities
Managing skills and training plans

Customer management
Reception and communication with the users: how to improve practices?
Customer service: organisation and means
Customer service: regulations and relations with the users
Drafting specifications for the purchase of a software for customer management

Public contracts
Initiation to public works contracts: water and sanitation
Management of public works contracts: water and sanitation
Public works contracts: water production and wastewater treatment plants

SAFETY OF THE PERSONNEL

Safety of the personnel working in sewerage systems
Work in confined space in sewerage systems
Safety when working with chlorine: working with and exchanging chlorine bottles
Risk prevention on main laying sites
Safety and hygiene in wastewater treatment plants
Analysis laboratory: hygiene and safety
Marking of working sites
Temporary signalling of working sites

WATER IN NATURAL ENVIRONMENTS

GROUNDWATER
Basics of hydrogeology
Protection of drinking water abstraction areas
Treatment of polluted groundwater
Groundwater monitoring: development, follow-up and interpretation of a piezometer network

RIVERS
Management
Plans for water development and management (SAGE): directions for use
Management plan and river maintenance
Overall and quantitative hydrology
Coypu: biology and trapping
River hydrometry: the gauger’s job
Ecological status of aquatic environments: chemical and physico-chemical aspects
Freshwater hydrobiology

Restoration
Rockfills in rivers
Follow-up of working sites in rivers
River restoration, maintenance and development

Diagnostics
River diagnostics
Assessment of the quality of aquatic environments and good ecological status
WATER USES
   Agriculture
   Water and agriculture
   Water body
   Design, construction, maintenance and monitoring of water bodies for recreational use

MONITORING
   Mapping
   Introduction to cartographic reference frames on water in France
   River mapping
   River modelling and GIS

WATER IN INDUSTRY

MANAGEMENT, ANALYSES AND CONTROLS
   Environmental management in SMEs - SMIs - ISO 14001
   Wastewater analyses for self-monitoring
   Validity and reliability of analyses of industrial wastewater
   Water abstraction and wastewater discharges by industries: legislative and regulatory framework

PROCESS WATER
   Initiation to the techniques used for producing industrial water
   Water treatment?: processes and controls
   Production of industrial water for agri-food industry
   Ion-exchange resins
   Boiler water - Cooling water

TREATMENT OF INDUSTRIAL WASTEWATER
   Operation
   Operation of a biological wastewater treatment plant - Level 1
   Operation of a wastewater treatment plant using activated sludge - Level 2
   Operation of a physico-chemical wastewater treatment plant (surface treatment not included)
   Operation of a sludge and liquid waste methanisation unit
   Treatment by membrane bioreactors
   Sizing
   Sizing of wastewater treatment plants using activated sludge in agri-food industry
   Zero discharge: evapo-concentration of industrial wastewater
   Pollution removal: clean technologies
   Sludge treatment
   Sludge re-use in agriculture: regulations, responsibilities and implementation

DECONTAMINATION BY SURFACE TREATMENT
   Basics in detoxification
   Detoxification of wastewater
   Operation of a detoxification plant
   Design and sizing of detoxification plants

WEB-TRAINING
   Rain water: resources, risks, management and treatment
   Water saving and the Water Framework Directive