

# Water Treatment Technician

## Unit WTT002 Coagulation and Clarification Control (Chemical dosing)

This training specification has been developed from the water process technician standard. The specification details the **minimum** training specification, as agreed by industry employers, to deliver the skills and knowledge required to carry out the coagulation and clarification control (chemical dosing) process in the water sector.

The specification details the critical requirement of the activity to carry out the work outlined and does not preclude employers from adding to the skills and knowledge detailed by the specification in their own training programmes.

All work must be carried out to approved procedures and practices and in accordance with statutory health, safety and environmental requirements.

### What does this specification look like?

Water treatment technicians need to be able to:

- CC1 Control the coagulation and clarification process on water treatment works
- CC2 Optimise the coagulation and clarification process on the basis of test results and analysis of trends
- CC3 Restore the coagulation and clarification process to normal operation through identification of the root cause of faults arising with the process

### What do I need to take this module?

Candidates to be **assessed** as competent in this area should have successfully completed the modules shown below or have evidence demonstrating an equivalent level of competence.

1. COSHH
2. National Water Hygiene Scheme

## Performance Criteria

To achieve this unit, you will need to be able to:

### General Requirements

- P1. Identify the work area to be accessed using company documentation, systems and work instructions
- P2. Select, inspect and wear required PPE in line with company procedures
- P3. Carry out a site specific risk assessment of the work area, identifying the hazards and control measures required
- P4. Maintain accurate and up to date records
- P5. Report information and data to the designated person

### Task Specific – Water Treatment Processes – Coagulation and Clarification Control (Chemical dosing)

- P6. Identify and locate the control plant on the information system (e.g. SCADA) and on the works for both coagulation and clarification
- P7. Identify all mechanical, electrical and instrumentation assets which monitor and control the coagulation and clarification processes on the information system (e.g. SCADA) and on the works
- P8. Control the coagulation and clarification process within operational parameters
- P9. Calibrate, monitor and check coagulation and clarification control on the works, completing associated calculations, or utilising look-up tables
- P10. Evaluate trend data from the information system and test results to identify:
  - a) Normal trends or cycles for the works, and
  - b) Atypical trends or changes and the underlying or root causes for the change
- P11. Optimise the coagulation and clarification process based on test results and trend data
- P12. Instigate corrective action to return the processes to compliant conditions, taking account of process lag time

## Knowledge and Understanding

To achieve this unit, you will need to know and understand:

### General Requirements

- K1. The principles of Health, Safety and Environmental legislation when working with water treatment processes
- K2. The organisation's safety rules, policies and procedures when working with water treatment processes

- K3. The hazards associated with working with water treatment processes and the correct way to respond to them
- K4. How to select, inspect and use PPE when working with water treatment processes
- K5. How to carry out a site specific risk assessment and identify workplace hazards
- K6. How to respond in the event of an emergency situation in the workplace environment
- K7. How to leave the work area in a safe and secure condition
- K8. The company recording and reporting process

### Task Specific – Water Treatment Processes – Coagulation and Clarification Control (Chemical dosing)

- K9. The objectives of the coagulation and clarification control processes and consequences of sub-optimal performance
- K10. Key process parameters and variables associated with the coagulation and clarification control processes, including:
  - a) The influence of variable raw water quality
  - b) Design limitations of works
  - c) De-sludging and flow rates
- K11. The rules governing the utilisation of returning wash water to the head of the works and its impact or influence on the operation of the works
- K12. How to interrogate the information system to:
  - a) Identify and control items of mechanical, electrical and instrumentation equipment
  - b) Evaluate trend data differentiating normal operational cycles from developing fault conditions
- K13. How to confirm the configuration, operation and performance of the actual coagulation plant corresponds to the information system
- K14. The types of coagulants and coagulant aids used and the factors that influence their selection, to include:
  - a) Use
  - b) Interaction
  - c) Sequence of addition
- K15. The range of instrumentation and activities used to monitor and control the coagulation and clarification control processes and their calibration requirements
- K16. The range of plant used to store, mix and pump chemicals and the methods of operation available
- K17. The safe handling and use of chemicals associated with the works
- K18. How the de-sludging process relates to the operation of the wash water recovery system
- K19. Alarms, action levels, authorisation levels and consequences associated with the process or processes including legislative

- K20. How to complete jar tests to specification and any limitations, including analysis of results
- K21. How to identify the root cause of the coagulation and clarification control process problems and the sequence of actions required to restore the process to compliant conditions, taking account of all process variables and process lag times
- K22. Maintenance requirements key equipment and processes needs

### How will it be assessed?

To achieve this unit, you will need to be able to provide evidence of the performance criteria and the knowledge and understanding requirements listed above.

Assessment types:

1. External assessment – an external accrediting body will assess against a national minimum standard
2. Internal assessment process – a company led on-going assessment against requirements
3. End-point assessment – see assessment plan for further details here (will be Energy & Utility Skills defined)

### What type of evidence will be expected?

To achieve this unit, you will need to be able to provide evidence of the performance criteria and the knowledge and understanding requirements listed above.

Evidence types:

1. On-going local assessments
  - a) Assessment plan, review, feedback, standard assessment sheets
2. Knowledge based learning
  - a) Classroom, exams, assignments, Q&A sessions, e-learning modules
3. Evidence portfolios
  - a) Learning logs, photos, observation sheets

### Assessment types and process

