Wastewater Treatment Technician

Unit WWTTC07 Activated Sludge Process

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 activated sludge process operations used 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?

Wastewater treatment technicians need to be able to:

ASP1 Control activated sludge process operations on wastewater treatment works

ASP2 Optimise activated sludge process operations on the basis of process performance, test results and analysis of trends

ASP3 Restore operations activated sludge 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. Wastewater flows and hydraulics
2. Process control systems

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 the control measures required
P4. Maintain accurate and up to date records
P5. Report information and data to the designated person

Task Specific – Activated Sludge Process

P6. Safely carry out operational and first line maintenance tasks relating to the process, pumps and tanks including removing blockages and fault finding
P7. Identify and locate the activated sludge process and final settlement tanks and associated equipment on the works and on the information system e.g. SCADA / HMI
P8. Identify all mechanical, electrical and instrumentation assets which monitor and control the activated sludge processes on the works and on the information system e.g. SCADA / HMI
P9. Confirm the correct configuration, operation and performance of the activated sludge process and ancillary equipment corresponds to the information system e.g. SCADA / HMI
P10. Identify and maintain control parameters associated with activated sludge processes on their works
P11. Respond to alarms correctly
P12. Instigate corrective actions to restore the activated sludge processes to compliant conditions, taking account of process lag time
P13. Evaluate trend data from the information system e.g. SCADA / HMI and process performance 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
P14. Complete final settlement tank sludge level monitoring to specification, appropriate to the works
P15. Optimise the activated sludge process operations to efficiently achieve the required parameters
P16. Take samples from the correct locations to monitor the process and carry out the required analysis relating to:
    a) Dissolved oxygen monitoring

b) Mixed Liquor Suspended Solids (MLSS)
c) Stirred Specific Volume Index (SSVI)
d) Microscopic analysis of MLSS
e) Calculation of sludge age
f) Returned activated sludge (RAS) and surplus activated sludge (SAS) rates

P17. Correctly interpret microscopy findings and other sample analysis in relation to activated sludge performance monitoring

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 in relation to working with wastewater
K2. The organisation's safety rules, policies and procedures relating to working with wastewater
K3. The hazards associated with working with wastewater and the correct way to respond to them
K4. How to select, inspect and use PPE when working with wastewater
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 - Activated Sludge Process

K9. How to safely carry out operational and first line maintenance tasks taking into account any systems of work and operating procedures
K10. The objective of the activated sludge process, final settlement tanks and ancillary operations and describe the flow sheet, including any works returns
K11. The different types of activated sludge processes, final settlement tanks, pumps and associated ancillary equipment available (including configuration, loading and aeration), bacteria associated with them, design considerations and capabilities including nitrifying and non-nitrifying plant and common problems associated with the process
K12. Key process terms, parameters and variables associated with activated sludge process and final settlement tank system design and be able to describe the relationship between these
K13. The correct design and operation of activated sludge processes, final settlement tanks and ancillary equipment and the consequences of sub-optimal/poor performance

K14. Understand the parameters and tests required to monitor the process and why the analysis is important
K15. How to complete sludge level monitoring to specification and any limitations
K16. The consequences of sub-optimal RAS and SAS operations on the activated sludge process and any subsequent process streams
K17. Set-points applicable to the activated sludge process and explain the impact of variable wastewater quality and weather conditions on these
K18. How to interrogate the SCADA / HMI system to:
    a) Identify and control Items of mechanical, electrical and instrumentation equipment
    b) Evaluate trend data differentiating normal operational cycles from fault conditions
K19. How to confirm the configuration, operation and performance of the activated sludge process, final settlement tanks, pumps and associated ancillary equipment and how it corresponds to the SCADA/HMI based system
K20. The range of instrumentation used to monitor and control the process and their calibration requirements
K21. How to identify the root cause of activated sludge process problems. Understand the sequence of actions required to restore the processes to steady-state conditions, taking account of all process variables and process lag times
K22. The tools used in first line maintenance tasks and their uses and limitations
K23. Alarms, action levels, authorisation levels and consequences associated with the process
K24. Data collection, recording, reporting and maintenance requirements

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