Wastewater Treatment Technician

Unit WWTTC06 Fixed Film Biological Treatment

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 fixed film biological treatment 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:

FFB1 Control fixed film biological treatment operations on wastewater treatment works

FFB2 Optimise fixed film biological treatment operations on the basis of process performance, test results and analysis of trends

FFB3 Restore fixed film biological treatment operations 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
3. Wastewater compliance and performance monitoring

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

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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 fixed film biological treatment processes and associated equipment on the works and on the information system e.g. SCADA / HMI such as:
    a) Humus tanks
    b) Pumps
    c) Recirculation equipment
    d) Wash cycles
    e) Desludge cycles
P8. Identify all mechanical, electrical and instrumentation assets which monitor and control the fixed film biological treatment on the works and on the information system e.g. SCADA / HMI. This may include:
    a) Humus tanks
    b) Pumps
    c) Recirculation equipment
    d) Wash cycles
    e) Desludging
P9. Confirm the correct configuration, operation and performance of the fixed film biological treatment processes, humus tanks and associated equipment and that it corresponds to the information system e.g. SCADA / HMI
P10. Identify and maintain control parameters associated with the fixed film biological treatment processes, humus tanks and associated equipment
P11. Respond to alarms correctly
P12. Instigate corrective actions to restore the fixed film biological treatment processes to compliant conditions, taking account of process lag time

P13. Take samples from the correct locations to monitor the process and carry out the required analysis relating to:
   a) BOD
   b) Ammonia
P14. Complete any required sludge level monitoring to specification, appropriate to the works
P15. Optimise the fixed film biological treatment operations to efficiently achieve the required parameters
P16. Carry out operations to minimise the risk to process performance
P17. Evaluate trend data from the information system e.g. SCADA / HMI, tests and / or 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

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

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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 fixed film biological treatment processes. The type, purpose and requirement for ancillary equipment. Describe the flow sheet, including any works returns
K11. The main generic different types of fixed film biological treatment processes, their correct design and operation and the consequences of sub-optimal / poor performance. This process design may include:
   a) Humus tanks

b) Ancillary equipment
c) Recirculation
d) Desludge cycles
e) Wash cycles

K12. Key process terms, parameters and variables associated with fixed film biological treatment process system design and be able to describe the relationship between these

K13. The design considerations associated with the different types of fixed film biological processes including nitrifying and non-nitrifying plant, configuration (including recirculation, double filtration etc.), loadings (hydraulic and organic), media types and aeration equipment if applicable, their design and capabilities and common problems associated with the processes

K14. The parameters, tests and key monitoring points required to ensure the process is operating satisfactorily, why the analysis is important, and be able to carry out the required analysis relating to:
a) BOD
b) Ammonia
c) Calculation of loading rates – hydraulic and organic

K15. How to interrogate the information system e.g. SCADA / HMI to identify and control items of mechanical, electrical and instrumentation equipment

K16. Evaluate trend data differentiating normal operational cycles from fault conditions

K17. How to confirm the configuration, operation and performance of the fixed film biological treatment processes, humus tanks, pumps and associated ancillary equipment and how it corresponds to the information system e.g. SCADA / HMI

K18. The range of instrumentation used to monitor and control the process and their calibration requirements

K19. Alarms, set points, action levels, authorisation levels and consequences associated with the process

K20. How to identify the signs of sub-optimal fixed film biological treatment processes and relate the impact on any subsequent process streams including the potential impact of:
a) Maintenance
b) Deliberate adjustments
c) Recirculation
d) Taking a process unit out of service

K21. How to identify the root cause of fixed film biological treatment process problems

K22. Nuisance issues associated with fixed film biological treatment processes – fly control, foam (netting & chemical)

K23. The sequence of actions required to restore the processes to normal operational conditions, taking account of all process variables and process lag times

K24. How to complete relevant tank sludge level monitoring to specification and any limitations

K25. The tools used in first line maintenance tasks and their uses and limitations

K26. 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