International Anaerobic Digestion Certification Scheme

Operational Guidance Notes

This operational Guide Note is intended to assist you ensure the scheme criteria will be met with the appropriate evidence.

Module 5: Maintenance of plant, kit and infrastructure

Ensuring that plant, kit and site infrastructure is well-maintained helps ensure the plant runs efficiently and safely.

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5.1

To have maintenance schedules for all items of plant and equipment and keep records of completed maintenance.

This should cover:

- **Frontline maintenance;**
- **Reactive maintenance;**
- **Planned maintenance; and**
- **Preventative maintenance.**
- **Written Schemes of Examination**
- **Risk Assessments**
- **Dynamic Risk Assessments**

Integrity Inspection & Major Repairs should take into account:

- **Design & Design Code**
- **Construction**
- **Modification Control**
- **Suitability for future maintenance**
- **Reliability**
- **Special requirements i.e. for ageing or worn plant**
- **Misguided removal of process plant.**

Guidance

- To prepare a maintenance plan and schedule for all items and equipment on site.

- To have guidance written for all maintenance maneuvers, including health and safety considerations.
- To keep records of the maintenance and schedule – preferably these should be an electronic system, but paper is acceptable.
- To have procedures in place in case of emergency maintenance.
- The schedules should be immediately accessible by those who need to and there should be some sort of overall control and document management.
- Schedule should include compliance maintenance requirements (emission testing, sample records and others applicable)
- Maintenance plan as a minimum should refer to manufacturer standards, different best methods maybe present and applicable.

5.2

To ensure that all plants and equipment undergoes maintenance in accordance with the manufacturers guide.

Guidance

- To keep a record of manufacturer's guidance and best practices recommended for the equipment.
  Recommended to keep manufacturer's contact details for when necessary.
  All equipment and parts changes should be in accordance/compatible with the manufacturer's design.
- To keep records of the maintenance and schedule – preferably these should be an electronic system, but paper is acceptable.

5.3

To keep copies of any contracts for maintenance and keep records of maintenance carried out.

Guidance

- Keep records of the maintenance, contracts and schedule. – preferably these should be an electronic system, but paper is acceptable.
- When necessary, to keep records of any incidents during maintenance and all following actions taken.
- Maintain records of contractors details (insurance, training certificates form staff or other applicable).

5.4

To keep records of expected lifetime of the item and of any operational decisions taken which could risk failure or reduced expected lifetime. To undertake Electrical Thermography Inspection and Gas Leakage Detection at a suitable frequency for the age of the plant.

Guidance

- To keep records of manufacturer's information regarding the equipment's life expectancy. Correct maintenance will increase life spam of equipment. Suitable assessments on certain equipment maybe require by third party contractors (example, digestor/reactor tank my have a life expectancy of 20 years but due to nature of operations and effective supervision and maintenance these can last up to 40 Years. A

structural engineer inspection of interior and exterior maybe applicable to ensure the satisfactory and safe use of the tank.

- Provide guidance on how to minimize the risks of failure of all equipment and ensure that it is followed by all operators (training and SOP`s).
- To keep records of the maintenance and possible impacts on equipment's life expectancy – preferably these should be an electronic system, but paper is acceptable.
- To undertake Electrical Thermography Inspections frequently (recommended every 6 months, more frequently if equipment is high-risk)

  If inspections conducted by site operators, make sure:
  - To have a maintenance plan and health and safety guidance for the inspection
  - To use proper equipment and gear
  - Operators can read and understand the results on the inspection and know the actions to be taken if necessary
  - Suitable qualifications and competency of staff
- To conduct Gas Leakage Detection
  - Have a continuous monitoring of possible Gas Leakage
  - Inspections conducted frequently (recommended monthly)
  - Conduct inspections after every maintenance
  - Different methods applicable
  - Monitor relevant instrumentation and carry out regular visual inspections

5.5

To have a list of critical items and spare parts where necessary.

Guidance

- To have a list from the manufacturers of all critical items and spare parts necessary to have ready on site. List maybe completed in house as different components will have different critical levels (dependent on other systems or technologies applicable).
- To ensure that all items on this list are available and ready to use on site.
- All equipment and parts changes should be in accordance/compatible with the manufacturer's design.

5.6

To have a list of back-up suppliers for all critical items and the expected replacement time. To ensure all replacement spares are proprietary manufacturer's equipment.

Guidance

- To have a list from back-up suppliers for all critical items and spare parts necessary.
- All equipment and parts changes should be in accordance/compatible with the manufacturer's design.
    - To have evidence records of suitability of parts.
    - Considerations on refurbishment options
- Access to list of local suppliers to ensure quicker turn around times.
- Assess the requirement to have critical parts available on site, some parts maybe stored with partnerships companies.

5.7

To have written specifications for each item of plant and equipment.

Guidance

- To keep a record of all manufacturer's information regarding each item of the plant and equipment
    - Recommended to keep manufacturer’s contact details for when necessary.
- Ensure critical equipment is suitably identified, equipment that can jeopardize the operations and cause an impact on Performance (Environmental, Health and Safety, Compliance or Financial).

5.8

To have a suitable workshop and tools for site staff to carry out maintenance.

Guidance

- To ensure that a suitable space is designated to a workshop during the design and planning phase
- Workshop should have all necessary tools for staff to carry out their work appropriately and should respect all necessary health and safety regulations
- To be ready for a visual inspection.

5.9

To be able to demonstrate that maintenance is actually undertaken in accordance with the schedule in a timely manner.

Guidance

- To keep records of the maintenance and schedule – preferably these should be an electronic system, but paper is acceptable.
    - If going through a contractor for maintenance, keep a record of contracts
    - Keep Pre- and Post- maintenance documents, maintenance sign-off on completion records and inspection and/or testing records as proofs that maintenance was undertaken

5.10

Leakage Detection And Repair (LDAR) testing carried out regularly.

Guidance

- To conduct LDAR testing (Recommended every 6 months) following best available practices
    - Leak Definition: Defining Leak values under regulation requirements
    - Have a LDAR planning/guidance framework for operators to conduct work properly in accordance with best practices and health and safety regulations
    - Monitoring and Testing equipment properly, positioning the detection equipment to properly to identity any leaks

    - Repairing promptly after leak detection and keeping a record of repairs
- When possible have a pre a post repairs evidence to track improvements of the plant.
- To record testing report with evidence of resolving challenges presented
- Different technologies can be used to comply with this.
- Ensure report of LDAR is subsequently linked to GHG calculations and evident reductions are presented.

5.11

Evidence of Integrity checks on storage tanks

Guidance

- To have evidence that an integrity checks inspection of the tank (maintenance) was conducted as per manufacturer instruction. If evidence based is required this should be carried by a structural engineer. Internal checks (regularity to be considered by manufacturer or compliance requirements)
- To ensure that integrity check follows best available practices and health and safety regulations.

  Best practices include:
    - External and Internal inspections conducted by qualified worker
    - Conduct pressure test and/or gas leak detection test
    - Verify structural integrity of the tank (different technologies applicable such as ultrasonic, magnetic particle or others applicable)
    - Inspect and test safety system (if applicable) – pressure valves or others
    - Check condition of piping, valves and other components linked to tank
- To keep records of the maintenance and all repair work conducted if necessary.

5.12

Evidence of Emission testing, requirements from Environmental activities or combustion requirements

Guidance

- To keep evidence that MCERTS on CHP or other combustion units have been tested. Equipment such as Boilers, back generators and others may require regular emission testing.
- https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32015L2193
- To have in place Continuous Emission Monitoring (dependent on country requirements)
- To conduct regular Emission testing with the appropriate method (Grab Sampling, Chemical Analyzer)
- To keep data records from testing and from monitoring.

5.13

Methane slippage records and testing methodology.

Combustible formula required to ensure threshold. This channel emissions should not be recorded by LDAR mechanisms.

Guidance

- To have evidence that a methane slippage record and testing methodology in place Methodology should consider:
    - Data of biogas/biomethane produced, used and emitted
    - Testing procedure and calculation of potential methane leakage
    - Mitigation strategies to limit slippage/emissions
- To keep records of testing on units that use Biogas or Biomethane, calculation is based on input materials. Combustion will have 1% to 3% acceptance
- To keep records of all slippage and maintenance work undertaken
- https://eur-lex.europa.eu/eli/reg/2024/1787/oj

Other informative links

- Maintenance of work equipment - Work equipment and machinery (hse.gov.uk)
- Using contractors: A brief guide (hse.gov.uk)
- Control and monitor emissions for your environmental permit - GOV.UK (www.gov.uk)

Appendix: Module Criteria Table

Criteria	Appropriate evidence	Exceptions where criteria don't apply	Auditor form (to be completed by auditor)	
			Evidence provided	Conformance assessment
5. Maintenance of plant, kit and infrastructure *Ensuring that plant, kit and site infrastructure is well-maintained helps ensure the plant runs efficiently and safely.*				
5.1 Have maintenance schedules for all items of plant and equipment and keep records of completed maintenance. Must cover: •Frontline maintenance; •Reactive maintenance; •Planned maintenance; and •Preventative maintenance. •Written Schemes of Examination •Risk Assessments •Dynamic Risk Assessments Integrity Inspection & Major Repairs should take into account: •Design & Design Code •Construction •Modification Control •Suitability for future maintenance •Reliability •Special requirements i.e. for ageing or worn plant •Misguided removal of process plant.	•Inspection of maintenance schedules and records – preferably these should be an electronic system but paper is acceptable. •The schedules should be immediately accessible by those who need to and there should be some sort of overall control and document management.			

5.2 Ensure that all plant and equipment undergoes maintenance in accordance with the manufacturers guide.	•Inspection of maintenance schedules and records – preferably these should be an electronic system but paper is acceptable.			
5.3 Keep copies of any contracts for maintenance and keep records of maintenance carried out.	•Inspection of maintenance schedules and records – preferably these should be an electronic system but paper is acceptable.			
5.4 Keep records of expected lifetime of the item and of any operational decisions taken which could risk failure, or reduced expected lifetime. To undertake Electrical Thermography Inspection and Gas Leakage Detection at a suitable frequency for the age of the plant.	•Inspection of maintenance schedules and records – preferably these should be an electronic system but paper is acceptable.			
5.5 Have a list of critical items and spare parts where necessary.	•Inspection of maintenance schedules and records – preferably these should be an electronic system but paper is acceptable.			
5.6 To have a list of back up suppliers for all critical items and the expected replacement time. To ensure all replacement spares are proprietary manufacturer's equipment.	•Inspection of maintenance schedules and records – preferably these should be an electronic system but paper is acceptable. Evidence records of suitability of parts.			
5.7 To have written specifications for each	•Inspection of maintenance schedules and records –			

item of plant and equipment.	preferably these should be an electronic system but paper is acceptable.			
5.8 To have a suitable workshop and tools for site staff to carry out maintenance.	•Visual inspection.	If maintenance is contracted, workshop not be required.		
5.9 To be able to demonstrate that maintenance is actually undertaken in accordance with the schedule in a timely manner.	•Inspection of maintenance schedules and records – preferably these should be an electronic system but paper is acceptable.			
5.10 Leakage Detection And Repair testing carried out regularly.	•Testing report with evidence of resolving challenges presented			
5.11 Evidence of Integrity checks on storage tanks	•Integrity checks inspection of the tank (maintenance) - as per manufacturer instruction. Internal checks (regularity to be considered by manufacturer or compliance requirements)			
5.12 Evidence of Emission testing, requirements from environmental activities or combustion requirements	MCERTS on CHP or other combustion units. Equipment such as Boilers, back generators and others may require regular emission testing. Data records. Testing in accordance with EU directive 2015/2193			
5.13 Methane slippage records and testing methodology.	•Records of testing on units that use Biogas or Biomethane, calculation is based on input materials.			

Combustible formula required to ensure threshold.				