

Maintenance Schedule

OP01 Issue 1.0

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1.0 PURPOSE

This document aims to outline the procedure which must be followed by University of Liverpool Energy Company Limited (hereon referred to as ULEC) to ensure the site fulfils the requirements of its Environmental Permit conditions.

1.1 Procedure Overview

This procedure document details how ULEC shall implement equipment pre-use checks, weekly site inspections and ensure maintenance, servicing and calibration works are undertaken at the required frequencies. This document provides clarification on the roles and responsibilities for the aforementioned maintenance processes.

2.0 SCOPE OF SITE MAINTENANCE

ULEC shall proactively maintain the work environment and site infrastructure in accordance with the site's Environmental permit conditions. The table below provides an overview of all areas covered within the scope of this procedure.

Infrastructure	Daily / Weekly Site Inspection	Maintenance & Calibration
Boilers 1-3	Constant remote monitoring via BMS	6-12 months
CHP 1	Constant remote monitoring via DIA.NE	6-12 months
CHP 2&3	Constant remote monitoring via TEM	6-12 months
Valves	Daily/Weekly	Annual maintenance
Control valves	Constant remote monitoring via BMS	Annual maintenance
Sidestream filter	Constant remote monitoring via BMS	Annual maintenance
Vacuum degasser	Constant remote monitoring via BMS	Annual maintenance
Pressurisation unit	Constant remote monitoring via BMS	Annual maintenance
Vessels	Weekly	Annual maintenance
Pipework and Insultation	Weekly	Annual maintenance
Dirt separator	Weekly	Annual maintenance
Gas solenoid/slam shut valve	Weekly	Annual maintenance
Controls incl. BMS	Constant remote monitoring via BMS	Annual maintenance
Gas detection and alarm	Constant remote monitoring via BMS	Every 6 months

Infrastructure	Daily / Weekly Site Inspection	Maintenance & Calibration
Pumps and cold water booster set	Constant remote monitoring via BMS	Every 6 months
Fire alarm	Constant remote monitoring via BMS	Weekly test and annual maintenance
Water softener	Constant remote monitoring via BMS	Annual maintenance
CO detection and alarm	Constant remote monitoring via boiler control panel	Annual maintenance
Flue	Constant remote monitoring via boiler controller	Annual maintenance
Meters	Constant remote monitoring via BMS	Annual maintenance
CHP (engine)	Constant remote monitoring via BMS	Planned maintenance by Janbacher (CHP1) and maintenance contractor (CHP2 and CHP3). Service every 2,000 hours.
CHP (filters and oil)	Weekly	Every 1000-2000 hours
CHP (intermediate service)	Constant remote monitoring via BMS	Every 10,000 hours
CHP (overhauls)	Constant remote monitoring via BMS	Every 60,000 hours
Dry air coolers	Constant remote monitoring via BMS	Every 6 months
Water treatment system analysis	Constant remote monitoring via BMS	Twice a year during planned preventative maintenance
Flue inspections	Constant remote monitoring via BMS	Annual maintenance
Heat exchanger	Constant remote monitoring via BMS.	Annual maintenance. Serviced by plate heat exchanger specialists.
Mechanical ventilation system	Constant remote monitoring via BMS and engine controllers	Annual maintenance
Safety valve (hydraulic system)	Weekly	Depending on the type of safety valve – serviced every 3-12 months. Removed and

Infrastructure	Daily / Weekly Site Inspection	Maintenance & Calibration
		sent for inspection, testing and certification.
Emergency lighting (inc. batteries)	Monthly	Tested every month
Expansion vessels	Monthly	Every 6 months
Break tank	Weekly	Every 6 months

3.0 SITE INFRASTRUCTURE & MAINTENANCE PROCEDURE

The various maintenance processes implemented by ULEC are as follows:

3.1 Weekly Site Inspection Checks

- 1) A competent person (maintenance staff) will undertake a weekly inspection of the site. The inspection will be undertaken and documented using the *Site Checklist Template*.
- 2) The Carbon and Utilities Manager will ensure that all documented site inspections are retained in accordance with the Environmental Permit.
- 3) Any minor issues identified by the site inspection shall be resolved and overseen by the Primary Site Operational Lead and/or the CHP Manager. The Maintenance and Engineering Hub Manager may delegate actions to site operatives where required.
- 4) Any significant issues identified such as permit condition breaches or compliance obligation breaches will be recorded in the Boilerhouse Logbook. In such instances, the Director of Estates shall also be consulted where required to ensure the issue is resolved. The CHP manager shall retain responsibility for overseeing the implementation of any necessary corrective actions, in liaison with the Carbon and Utilities Manager and Maintenance and Engineering Hub Manager.

4.0 ROLES AND RESPONSIBILITIES

The roles and responsibilities for upholding this procedure are as follows:

4.1 Site Operatives Shall:

- Where required undertake pre-use checks of equipment prior to use;
- Inform the Maintenance and Engineering Hub Manager of any identified defects or issues relating to site infrastructure or equipment;
- Ensure equipment is secured when not in use and stored appropriately; and;
- Ensure equipment is used in accordance with the manufacturer's instructions

4.2 The Primary Site Operational Lead shall:

- Ensure records of, site inspections and, equipment and infrastructure maintenance are maintained;
- Ensure maintenance and servicing of plant equipment takes place at the required intervals following relevant methodologies and standards where appropriate.
- Maintain a log of all maintenance, servicing and calibration of infrastructure and equipment used on the site;
- Co-ordinate and arrange maintenance, servicing and calibration works, ensuring the work is carried out by a suitably qualified person;
- Ensure all plant equipment out of service or requiring maintenance is appropriately secured preventing unauthorised access or use;
- Ensure all plant equipment and monitoring equipment is identifiable and stored appropriately when not in use;
- Annually review the need for changes to the sites existing infrastructure.

4.3 The Director of Estates shall:

- Retain overall accountability for ensuring the work environment, infrastructure and plant equipment is maintained and fit for purpose;
- Annually review the need for changes to the sites existing infrastructure; and;
- Authorise the purchase of any new infrastructure or plant equipment where required.

4.4 The Facilities Engineer and Appointed Engineers shall:

- Provide evidence of their competency to undertake maintenance, servicing or calibration works;
- Undertake maintenance, servicing or calibration works following recognised standards or methodologies where appropriate; and;
- Provide a formal record of works undertaken.

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