TITLE:	Leak Detection & Repair Plan
Ref:	ENOPSL1

1. Purpose

This LDAR plan has been produced to provide a clear process over the detection, monitoring, repair and associated recording of any leaks identified within RGUK AD operations. It's implementation will ensure the identification, and repair or, of any unintended fugitive emissions. Our aim is to reduce our environmental impact which will help comply with relevant environmental legislation, ensure permit compliance, provide a safer working environment for all employees, visitors and contractors and improve plant efficiency.

2. Scope

All RGUK Anaerobic Digestion facilities producing Biogas. For odour, ammonia and bioaerosols, a separate plan will be produced addressing these emission types. Detection methods will conform to the relevant applicable standards, namely EN15446:2008.

3. Objectives

The LDAR Plan objective is to ensure a systematic and consistent approach to the detection, monitoring and repair or replacement of leaking components and equipment. The procedures contained within this document covers the detection, monitoring and repair or replacement of leaking components and equipment that have the potential to release fugitive emissions.

This objective will be achieved by:

- Identification of Components and Equipment subject to the plan;
- Establishing arrangements for the detection of leaks;
- Establishing arrangements for monitoring leaking components and equipment;
- Establishing arrangements for repairing or replacing leaking components and equipment;

4. Plan Management

The plan will be reviewed at least annually, or sooner in the event of any significant change to process, equipment or personnel or in the event of any incident or accident that has occurred as a result of any gas release or plant failure.

The document will be reviewed in the same manner as all documents through the Safesmart Management System. All new revisions will be distributed to all applicable staff for sign off.

Physical checks, reporting of leaks and repair/replacement schedules will be managed through the FIIX maintenance system.

The plan works in correlation with the sites' DSEAR surveys and drawings. Any change to these documents will also result in a review of this LDAR plan.

5. Responsibilities

All personnel involved in leak detection, leak monitoring and leak repair/replacement procedures will receive training prior to commencement of their responsibilities.

Training will be undertaken by Site Management and a record of training will be recorded and held on site. Training will include:

- Technical understanding of the Leak Detection and Repair Plan;
- Personnel responsibilities for conducting leak detection and repair procedures; and
- Detection, monitoring, repair and replacement requirements and record keeping requirements.

All staff must adhere to RGUK's risk assessments and procedures in the event of any leak being detected.

SHEQ

- Responsible for discussing high risk leaks that have been detected;
- Review trends in leakages across all sites;
- Agree any deviations from the plan or a need to implement new plant and/or equipment
- Identify any new ATEX zones applicable to leak survey areas

HSE Manager

- Monitor the effectiveness of the plan and carry out the adhoc/periodic reviews of the document;
- Investigate any incidents or accidents as a result of leaks and report in accordance with any H&S and Environmental requirements;
- Safesmart action completion (i.e. quarterly leak checks) and escalation for any overdue actions.
- Oversee training requirements including new staff and refresher training for existing employees.

Site Managers

- Ensure that all relevant staff receive the necessary information, training and instruction on the LDAR plan;
- Manage the start to finish process involving periodic checks, reporting, repair work and ongoing monitoring;
- Reporting of leaks and consequent maintenance to Operations Director and Operations Compliance Manager.
- Ensure all staff, contractors and/or visitors are segregated from any leak points and that risks from explosion are nullified through suitable control measures as identified in the various RAMS.

Maintenance Manager

- Carry out quarterly leak detection surveys;
- Full management of FIIX system entries and any subsequent raised works orders;
- Identify and purchase equipment required to carry out repair work and making the necessary repairs;
- Carry out additional leak detection surveys post repair work to measure effectiveness;
- Organise, and manage, specialist contractors required to carry out maintenance work outside of maintenance department remit;
- Identify, train and supervise designated maintenance operator to implement LDAR activity in their absence.

Plant Operators

- Immediately report any leaks to Site/Maintenance Manager
- Ensure controls are put in place to prevent any incident or accident as a result of any leaks.

6. Emission Source Site Plan

To be added once finalised. Will identify both point and fugitive sources and their detection frequency.

7. Plant & Equipment Subject to Plan

Digester & associated plant

- Pressure Relief Valves

- All associated pipework
- Water traps
- Anti-foaming plates
- Inspection/access hatch on tank roof
- Inspection windows
- Isolation valves
- Digestate separation units

Final Store/Gas Dome

- Spot checks around the top of the tank where the outer membrane joins the concrete wall (minimum of 6 areas)
- Pressure Relief Valves
- Gas pipework
- Dome Blower and associated equipment.
- Inspection windows

**automatic detection already in place for space between inner and outer membrane*

Energy Centre

- Combined Heat & Power plant and associated equipment (e.g. gas booster)
- Gas Upgrading plant
- Gas Entry Unit and associated pipework
- Gas line (valves, sample points, welds)
- Condensate Pits
- Carbon filters and associated pipework

Other Areas

- LPG tanks
- Central Pumping Station
- Reception Storage
- Digestate storage
- Boiler Unit
- Flare and associated pipework

Quarterly checks are not required on the CHPs or Boiler as they have built in gas leak detection equipment and will alarm/shut down in the presence of any leak. These will however be subject to annual OGI surveys carried out by designated specialist contractor.

In any event where the emission source isn't immediately known, a process of elimination will be followed where all potential sources will be surveyed until the leak is located.

8. Check Types

In the event that a significant leak has been identified either through internal or external checks, the Maintenance Manager will take the necessary steps required to isolate the leak and prevent the release of significant fugitive emissions occurring, subject to how reasonably practicable it is to do so. Any leaks shall be the subject of frequent monitoring and the Maintenance Manager is responsible for ensuring that leaking components and equipment are regularly monitored to ensure that the leak does not increase. Monitoring is to be undertaken by authorised competent personnel who have received leak detection and monitoring training. The two check types are:

Internal

Maintenance Manager and/or designated Maintenance Operator will carry out quarterly checks using a handheld gas leak detector. The detector will conform to the relevant EN standards. All findings will be recorded on the FIIX maintenance system and details of any repair/replacement work needed also noted. Repair/replacement work will be prioritised in accordance with the following criteria:

- Type of leak
- Location of leak (i.e. ATEX ozone)
- Size/severity of leak
- Potential impact on the environment

The FIIX entry will include details of work required and a proposed completion date. The entry will closed out upon completion and include full details of the repair/replacement work carried out. A further test will be carried out after the maintenance work to ensure the All equipment used will be maintained and calibrated in accordance with the manufacturer's recommendations.

External

OGI (Optical Gas Imaging) will be carried out across the entire site (including energy centre plant) by specialist contractors on an annual basis. Full reports will be submitted to the relevant regulatory bodies. Any leaks identified will be repaired/replaced in accordance with the maintenance procedure detailed above.

Details of the specialist contractor carrying out the survey will be specified in the report including:

- name and address of the monitoring organisation
- names, experience and qualifications of the personnel carrying out the monitoring
- accreditation status of the monitoring organisation
- documented procedures used for the LDAR campaign and reporting
- quality assurance or quality control criteria
- name of the person approving the report for the monitoring organisation
- the signature of the person approving the report

Details of the site, conditions and measurement objectives will include:

- site name
- operator name
- permit number
- site processes (under normal operating conditions)
- date of the survey
- site operation on the date of the survey (for example, operating at full capacity or reduced load due to X and Y)
- weather conditions (including temperature, wind speed and wind direction)
- measurement objectives (for example, targeted processes, site areas)

Details of the survey carried out will include:

- areas of the site that were surveyed
- areas of the site that were not surveyed – including a reason why those areas were not surveyed
- leak definition used for the survey (for example, 500ppm, or detectable by the specified OGI camera at Xm)
- distance from which components were surveyed
- duration of measurements, at individual components and specified site areas

Results of the survey will include details of:

- list of leaks identified during the survey
- annotated plan of site (or piping and instrumentation diagram) showing the precise locations of the identified leaks
- time when each leak was identified
- a description of each leaking component identified (for example, valve, flange and so on) – include the component reference number where available
- a photograph of the leaking component showing the leak location
- severity of the leak – the measured methane concentration or leak rate, or the risk posed due to the component type and location (or both)
- emission estimate in kg/h for each component surveyed
- total site emission rate in kg/h, including uncertainty
- any non-conformities against the quality assurance or quality control procedures

9. Related Documents

- Site EMS
- HSPOLI1 Major Incident Plan
- ENOPSG1 Gas Release Response Procedure
- HSREFG1 Gas
- HSREFI1 Incident Response Process
- RA-AT1 Working in ATEX Areas

DOCUMENT CHANGE RECORD

	Reason for issue/Changes to document
Issue No: 1 Revision No: 1 Revised By: Chris Jenkins Issue Date: 19/01/26 Issued by: Iain Kerr	*Various changes in line with amended guidance.*
Issue No: 1 Created By: Chris Jenkins Issue Date: 15/12/22 Issued by: Iain Kerr	*Initial Document*