GP Biotec Ltd

Great Porthamel, Talgarth,

LD3 0DL

Gas Recovery System

Introduction

This procedure forms part of GP Biotec's Environmental Management System and addressed the sites environmental permit Improvement Programme Requirements for gas recovery systems.

1.0 Scope

This procedure defines the gas recovery system in place for GP Biotec.

2.0 Responsibility

The Managing Director has the overall responsibility to ensure implementation of this procedure along with the support of the management team at GP Biotec.

3.0 Gas Recovery Systems

3.1 Surplus Gas Burner (Flare)

GP Biotec has a 500m^3 HOST Surplus Gas Burner (SGB) installed, for the purpose of safety reasons or for non-routine operating conditions. This would be for example during start-ups or routine shutdowns. The flare forms part of GP Biotec essential site safety instrumentation. The SGB has a capacity of 500m3 per hour which has the required volume capacity to be utilised in the event of the sites CHP engines being down for routine or breakdowns. The SGB is fitted with a continuous ignition. The gas that is supplied, is transported along these ignition-sources. As soon as the gas is sufficiently flammable, the gas is ignited, and the torch will burn. The main components in this gas are methane, carbon dioxide and hydrogen sulphide. Due to the gases being burnt all instrumentation should be suitable within the DSEAR zone around the SGB including ATEX rated equipment. The SGB is also has a gas flow meter fitted to the pipework leading to the ignition so volume of gas burnt can also be recorded and monitored.

The SGB forms part of the sites routine monitoring and daily checks to ensure the ignition lights are displayed as green within the control panel, ensuring there are no faults. The SGB is also subject to site safety instrumentation checks which are scheduled for annual monitoring.

The SGB is not used during normal operating conditions on site at GP Biotec.

3.2 Combined Heat and Power Units (CHP)

GP Biotec has 2 x CHPs on site, each consuming 220m3 per hour, therefore a total of 440m3 total consumption provided. Allowing for additional SGB capacity which would cope with the required gas volumes if both CHPs were down at the same time and non-operational for non-routine operating conditions.

The two CHPs have their own service agreements in place with the engineer providers who carry out routine maintenance and inspections. Along with GP Biotec competence engineers on site who also carry out daily checks of the CHPs and record hours run readings.

3.3 Pressure Relief Valves (PRVs)

Over pressure relief valves are located on each digester at GP Biotec to ensure tank safety and integrity. In the event of over pressure within the digester tanks the function of the PRVs will automatically operate if the pressure exceeds a safe set point in the event that the SGB has not operated under the required conditions. Under normal circumstances the over pressure safety will not be used. It is guaranteed that the safety after opening will close completely. The overpressure of the digester has a maximum pressure of about 3,5 mbar. The feed to the digester will also be stopped, this results also in a stop of the feed to the secondary digester. The reduction and stop in feeding will result in a reduction of the biogas production.

Pipework on site is all built to BSN ISO 8085 standards.

GP Biotec undertake twice daily visual inspections of the PRVs, and routine inspections and checks are also scheduled as part of the site's maintenance schedule and site safety instrumentation checks.

3.4 Process / Plant Management

3.4.1 Feedstock / Waste Analysis

As part of GP Biotec core contract for biological support with Marches Biogas all new feedstocks accepted into site and potential feedstocks/wastes are all analysed for Biological Methane Potential (BMP) and/or Theoretical Methane Potential, which determines the volume of methane likely to be produced per gram of volatiles solids. Analysing the incoming feedstocks/wastes is an integral part of the mass balance process providing an efficient and economic method for estimating biomass conversion and biogas yield of feedstocks or feedstock blends. This then allows GP Biotec and Marches Biogas to establish a baseline for expected site performance and total biogas production. Feed rate adjustments can be made from these calculations to ensure the required amount of biogas is being generated to run the consumers whilst ensuring not to over feed and therefore over producing biogas.

3.4.2 Feed Reduction

For safety reasons all mechanical, electrical and process instrumentational works to be undertaken on GP Biotec site are strictly scheduled works to ensure that flaring is kept to a minimum, allowing for the management of gas production through the reduction of feed rate into the AD system. The reduction of feedrate, to a manageable volume to ensure incoming wastes do not stock up and can be stored appropriately, will help control the production of biogas.