GS YUASA BATTERY MANUFACTURING UK LIMITED EPR/BV5386IX/V004

1. Introduction

GS Yuasa Battery Manufacturing UK Limited operates a battery manufacturing plant on the Rassau Industrial Estate, South Wales. The site operations are permitted by Natural Resources Wales under Environmental Permit number EPR/BV5386IX/V004. The latest variation to this Permit, dated 13th June 2017, included a number of improvement programme requirements, including the following:

The operator shall submit, for approval by Natural Resources Wales, a report setting out progress to achieving the BAT Conclusions and BAT-AEL's where BAT is currently not achieved, but will be achieved by the 30th June 2020. The report shall include, but not be limited to, the following:
1. Current performance against the BAT Conclusions and BAT-AEL.
2. Methodology for reaching the AELs.
3. Associated targets / timelines for reaching compliance by 30th June 2020.

The report shall address all of the relevant BAT Conclusions.

This report has been prepared in response to the improvement programme requirement specified above, and details the operator's current performance against BAT-AELs where BAT is not currently in place, the intended route to achieving BAT-AELs by 30th June 2020, including an update on progress to date, and sets associated timelines and targets for achieving compliance by 30th June 2020.

2. Background

Commission Implementing Decision (EU) 2016/1032 of 13 June 2016 establishing best available techniques (BAT) Conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the non-ferrous metals industries, was published on 30th June 2016. The UK has four years from this date of publication to ensure that operators of relevant non-ferrous metals operations comply with the requirements of the BAT Conclusions document. As such, Natural Resources Wales requested in 2016 that GS Yuasa Battery Manufacturing UK Limited (then Yuasa Battery (UK) Limited) undertake an assessment against the BAT Conclusions document, to ascertain their level of compliance with the requirements, and this assessment was submitted to Natural Resources Wales in October 2016.

Since that time, the Environmental Permit for the site operations has been varied to implement the revised requirements specified by the BAT Conclusions document, and GS Yuasa Battery Manufacturing UK Limited is working within the terms of their amended Permit. Where the installation does not currently fully comply with the requirements of the BAT Conclusions document, it has a maximum of four years (to 30th June 2020) to achieve Best Available Techniques across the site. This report has been prepared to provide an update to current compliance, and a timeline for achieving full compliance with the BAT Conclusions, on or before that deadline.

The original BAT Conclusions gap analysis provided in October 2016 concluded that the installation was considered to largely be compliant with the BAT Conclusions. Where appropriate, a combination of techniques was already being applied to the operations such that, whilst not employing all of the detailed techniques for any one conclusion, the management, operation and control of the site processes ensured that overall compliance with the BAT Conclusion could be demonstrated. There were however four Conclusions with which the site was not considered to be fully compliant as follows:

- BAT is to implement an action plan on diffuse dust emissions, as part of the EMS, that identifies the most relevant diffuse dust emission sources (e.g. using EN 15445); and defines and implements appropriate actions and techniques to prevent or reduce diffuse emissions over a given time frame.

- BAT are employed to prevent diffuse emissions from the storage of raw materials.
- In order to prevent NO_x emissions to air from a pyrometallurgical process, BAT is to use one of the techniques given below:
    - Low-NO_x burners;
    - Oxy-fuel burners;
    - Flue gas re-circulation.
- ISO 5667 should be applied to water sampling and emissions to water should be monitored at the point where the emission leaves the installation at least once per month. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

As such, the site had committed to the following improvements:

1) The production of a documented action plan on diffuse dust emissions by the close of 2017.

2) Provision and use of bunded pallets for the storage of items such as resins, Hydrochloric Acid and Sodium Hydroxide, by 31st October 2016.
All bulk dilute Sulphuric Acid tanks will include high-level warning alarms by 30th April 2017.
The bulk Sodium Hydroxide tanks will have high-level alarms fitted by 31st May 2017.
The provision of a formal daily record of inspections for all bulk dilute Sulphuric Acid and Sodium Hydroxide storage areas by 30th November 2016.

3) An investigation into the potential options for the use of low-NO_x burners on the small number of combustion units where these are not currently available. After initial investigations, either a BAT Assessment of the available options, or a cost benefit analysis of improvements will be made and reported to Natural Resources Wales by 31st December 2017. The combustion units to be considered include: Pellet Casters which are direct-fired systems; Flash Drying Ovens; Space Heaters and the Cork Preparation Heater.

Additionally, through the issue of the revised Environmental Permit, Natural Resources Wales requested that, within six-months of the issue of the Permit (13th December 2017), the operator would submit a written plan assessing their water sampling techniques against ISO 5667. The plan must contain dates for the implementation of individual measures necessary to demonstrate adherence to ISO 5667.

The remainder of this report will focus on these four actions to be achieved and provides an update on current performance against these BAT-AELs, and the intended route to achieving full compliance by 30th June 2020. No information is provided here on the installation's other BAT Conclusion requirements, as these are already deemed to be met by the operation.

3. Current Performance

Since the provision of the gap analysis against the BAT Conclusions document in October 2016, the site has made the following progress against its targets to achieve BAT.

A site visit has been undertaken by Environmental Visage Limited (10th August 2017) in order to:

1) Assess the operator's performance in relation to the management and control of diffusive dust sources in order that a formal, documented diffuse dust management plan can be prepared.
2) Assess the operator's performance against their commitments to improved raw materials storage.
3) Review the number and nature of the gas fired burners at the site which do not currently employ low-NO_x technologies, and assess the potential for these burners to be adapted or replaced with low-NO_x installations.
4) Assess the operator's current effluent sampling techniques in order that a comparison can be made against ISO 5667.

A description of the findings of the site visit in relation to each key item is presented over page.

1) Management and Control of Diffuse Dusts

All dusty or potentially dusty areas across the installation include local exhaust ventilation (LEV) systems to ensure the protection of staff health. The operational area with the most significant potential for the creation of diffuse dust is Factory 1, which contains the plate manufacturing process. The pasting process, whereby Lead paste is produced and applied to the battery plates, is located within the middle of Factory 1, and thus, any dust created which might not be extracted through the LEV would still remain within the confines of the factory. Lead Oxide is stored within sealed silos and is transported across the factory using a combination of sealed screw-conveyors, flight conveyors and bucket elevator conveyors.

Exhaust systems are in place extensively across the site and may be fixed or flexible depending on the operation. The extract is filtered prior to release to atmosphere. Where the collected material is then removed from the filter, for example in bag filter systems, the collected dust is deposited into a fully enclosed system, usually a drum or other collection vessel which is lined with a bag and is sealed at the top to the extraction point. Some, such as the extraction point shown in the photographs below include plastic curtains around the collection point as a secondary protection measure against the potential for weather damage and wind-blown dust.



Photograph 1: Curtain shielded collection point



Photograph 2: Sealed filter collection systems

Although some of the collection points are necessarily positioned external to the factory buildings, the storage of collected dusty materials awaiting dispatch for recycling is appropriately managed. Once full, the bagged Lead wastes are sealed, and moved to a dedicated internal storage area, shown in Photograph 3 below. The majority of raw materials and waste storage is located within the factory buildings or dedicated stores. The exceptions to this are the storage of empty drums, pallets, and general waste within the compactor.



Photograph 3: Lead waste storage area, including lidded drums and sealed collection containers.

As well as the operational infrastructure, materials management and housekeeping are key. Operators are trained to check their workplace and collection bins regularly to ensure that materials are not in danger of overflowing, and dusty operations such as the paste line are cleaned between shifts to remove the potential for build-up and drying out of Lead paste.

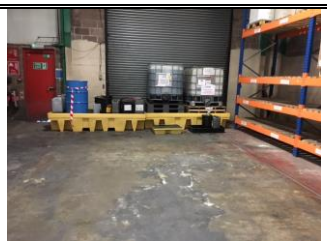
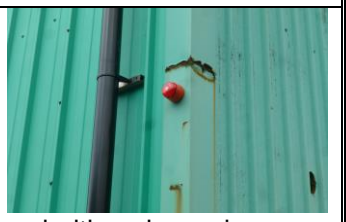
Floor cleaning is undertaken throughout the working period, and all extraction points are cleaned monthly to ensure continued operational efficiency. High-level infrastructure is cleaned once per year during the Christmas shut-down period. Site roadways are cleaned on a quarterly basis. All site cleaning is undertaken using vacuum or wet techniques to avoid dust creation caused by sweeping.

2) Raw Materials Storage

Three areas of improvement were identified by the BAT Conclusions gap analysis with regard to raw materials storage as follows:

- Not all potentially polluting liquids were stored in bunded areas within the main site warehouse;
- Bulk dilute Sulphuric Acid and Sodium Hydroxide tanks were not fitted with high-level alarms;
- There was no formal daily record of inspections for bulk dilute Sulphuric Acid and Sodium Hydroxide storage areas.

The operator had therefore committed to the provision of bunded pallet storage, high-level alarms on all bulk dilute Sulphuric Acid and Sodium Hydroxide tanks, and to implement a formal daily record of checks and inspections of the bulk Sulphuric Acid and Sodium Hydroxide areas. Progress against these commitments is shown in the table below, with all items except for the provision of high-level alarms on Factory 4 tanks now having been completed:

Item	Progress	Evidence
Purchase and use of bunded pallets for all potentially polluting liquid materials stored in the raw materials warehouse	Complete (31/10/2016)	  All potentially polluting liquid substances are now stored on secondary containment within the warehouse *Note: drums on the upper level in the second photograph contain a solid paste additive*
Fit high-level warning alarms to 2 bulk dilute Sulphuric Acid tanks and 1 x Sodium Hydroxide tank in Factories 1 and 2	Complete (19/08/2017)	  Alarms are fitted and operational although require some further works (by 30/10/2017). Strobe and / or audible alarms are fitted at various points (e.g. on tanks or close to delivery points), and signage has been ordered for delivery driver / operator information
Fit high-level warning alarms to 1 bulk dilute Sulphuric Acid tank and 1 x Sodium Hydroxide tank in Factory 4	Originally planned for completion by 30/09/2017 but delayed. New completion target 31/12/2017.	Delays in installation and commissioning. Alarms are hoped to be fitted by 30/10/2017, although an extended target date (31/12/2017) is specified to allow for full commissioning
Routine, daily inspections of all bulk dilute Sulphuric Acid and Sodium Hydroxide storage areas are now formalised and documented	Complete (06/07/2017)	See proforma reporting sheet appended to this report

3) Low NO_x Burners

The burners identified which do not currently employ low-NO_x techniques are:
Pellet Casters (direct-fired systems);
Flash Drying Ovens;
Space Heaters;
Cork Preparation Heater (direct fired system).

Although the steam generating boilers at the site also do not employ low-NO_x techniques, these have not been used in many years and will be completely removed from site during 2017.

Tremorfa Limited undertakes the regular boiler and burner checks and maintenance across the GS Yuasa Battery Manufacturing UK Limited installation, and discussion with engineer Chris Jenkins confirmed that they do not routinely measure NO_x from the site units. The current status of each of the areas which do not currently employ low NO_x systems and the proposals for identifying the Best Available Techniques which could be employed at the site are presented below.

Plant / Burner	Status	Proposal
Pellet Caster	An open gas flame which melts Lead directly into a pellet mould.	Limited potential opportunities currently identified - discuss with burner manufacturers. Measure flame temperature to assess potential for thermal NO_x creation. Possibly consider shielding the flame and / or reducing the temperature.
Flash Drying Ovens (Sovema and OSI)	Flash drying ovens are required to operate at ambient oxygen conditions thereby preventing the specific use of low-NO_x techniques. The systems are essentially tunnel driers which are open to atmosphere and which dry the plates as they are conveyored through the system.	Limited potential opportunities currently identified - discuss with burner manufacturers. Measure flame temperature to assess potential for thermal NO_x creation. Possibly consider shielding the flame and / or reducing the temperature.
Space Heaters	Only two of the five installed units remain operational, and one (Factory 2 Warehouse) will require replacement soon. The unit in Factory 3 is rarely used, and is in pristine condition as a result. Both are Combat 30 G heaters (30 kW).	Investigate replacement with low-NO_x units. Units are not direct fired, and hence emissions from Factory 3 unit could be monitored to confirm current NO_x levels to determine whether or not this can reasonably be kept in service.
Cork Preparation Heater	An open gas flame which heats a small mixing pot from below (similar to a pan on a stove). The heater has no ducted discharge and is in an open environment thereby preventing the specific use of low-NO_x techniques.	Limited potential opportunities currently identified - discuss with burner manufacturers. Measure flame temperature to assess potential for thermal NO_x creation. Possibly consider shielding the flame and / or reducing the temperature.

4) Sampling Techniques to ISO 5667

Consideration of the current sampling and sample storage techniques was made during the site visit, to enable a detailed assessment against the requirements of ISO 5667. Sampling currently appears to be largely compliant with the Standard, with only minor suggestions made regarding sample storage and preservation. Where appropriate and as advised by the full and formal review, the sampling methodology will be updated to include any requirements of ISO 5667 not currently addressed.

4. Attaining Compliance with Outstanding BAT Conclusions – Timeline

The site intends to comply with the BAT Conclusions where possible, and by or before 30th June 2020. In order to achieve this, the site will complete their initial studies into the opportunities available for improvements to their operational processes and infrastructure, and propose the following actions and associated timelines:

BAT Conclusion Item	Proposed Action	Complete By
Action plan on diffuse dust emissions as part of the Environmental Management System	Documented Action Plan to be prepared and submitted to NRW for approval	30th November 2017
	Implementation of approved documented action plan	31st December 2017
Improvements to raw materials storage	Work progressed and final works underway	31st December 2017
Application of low-NO_x burners where these are not already installed	Investigation to be completed	31st October 2017
	BAT assessment / cost benefit analysis of potential improvements	30th November 2017
	Improvement plan prepared and all assessments submitted to NRW	31st December 2017
	Implementation of improvement plan – timescales to be confirmed	01st January 2018 – 30th June 2020.
Sampling to ISO 5667	Assessment of current sampling techniques against ISO 5667	09th November 2017
	Improvement plan prepared and all assessments submitted to NRW	13th December 2017
	Implementation of improvement plan – timescales to be confirmed	01st January 2018 – 30th June 2020

5. Summary of Progress

Since the preparation of their BAT Conclusions gap analysis in October 2016, GS Yuasa Battery Manufacturing UK Limited has progressed work towards achieving BAT Conclusions where BAT cannot currently be fully demonstrated. The operator has already installed some improved infrastructure to ensure compliance, and has commenced assessments of the potential opportunities for further improvements to be made. GS Yuasa Battery Manufacturing UK Limited has commissioned external consultants and engineers to advise in the process.

The timescales for the studies to be complete and the improvements to be made where possible, will ensure a clear line of action from the close of 2017. In allowing up to 30 months for the implementation of improvements where available, it is considered that the operator is well placed to achieve full compliance with the BAT Conclusions by 30th June 2020.

APPENDIX **ACID AND CAUSTIC TANK DAILY INSPECTION REPORTING SHEET**

Daily Checks of Chemical Tanks, Pipe Work and Bunds

Bund No.	Storage Description	Tank Gauge Working	Telemetry Reading	Lamp Test (Control Panel)	Pipe-work Condition	Any Visual Sign of Leaks or Dripping	Any Liquid in Bund	Area Clear in Front of Fill Point	Padlock Fitted to Inlet Flange	Bund Floor Condition	Bund Wall Condition	Any Spillages Noted in Area	Fisher Valve Padlocked	Comments	Sign	Date
4	F.1 Bulk Acid Storage (Containing redundant tank No.7)															
4	F.1 Bulk Acid Storage (Adjoining above bund with 2 tanks joined together as tank No.1)															
5	F.2 Bulk Acid Storage (Containing Tank No. 2)															
5	(2 tanks joined together as tank No. 6)															
6	F.2 Bulk Caustic Soda Storage (Inside Effluent Plant S1, tank No. 4)															
8	F.4 Bulk Acid Storage (Containing Tank No.3)															
10	F.4 Bulk Caustic Soda Storage (Inside Effluent Plant S2, tank No. 5)															
11	Water Treatment Plant (Small tank Containing Sodium Hypochlorite)															

		Comments:	**Utilities Team Leader Sign**
Audited By:			
DATE:			**Date**