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20th March 2015

Dr Gareth Richards
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Our Ref: W:\Environmental\IPPC\Environment Agency Reporting\Permit Reporting\New Melt Shop\Quarterly\2015\CO Breach Report\CO Breach Report March 15.doc

Dear Dr Richards,

RE: Tremorfa Melt Shop EPR Permit TP3639BH CO Breach Report – Q1 2015

In accordance with the Tremorfa Melt Shop Environmental (EPR) Permit TP3639BH, please find below our formal response to Compliance Assessment Report (CAR) TP3639BH/0222822. Under Section 4 of the CAR, an action was raised and it stated: "CELSA must identify reasons for repeated exceedances of the CO emission limit and report to NRW by 31/03/2015 if these continue to persist in Q1 of 2015."

1.0 Introduction

Tremorfa Melt Shop is regulated under section 12 of the Environmental Permitting (England and Wales) Regulations 2010 (as amended) to operate an installation which carries out activities as defined within Section 2.1 A(1)(b) *'Producing, melting or refining iron or steel or any ferrous alloy, including continuous casting'*. As such the company is permitted in accordance to the terms and conditions of EPR Permit TP3639BH.

Under Schedule 3 – emissions and monitoring of the permit the company is required to continuously monitor the carbon monoxide emissions from point source stack A1 against specified limits, as stated in Table S3.1. Any exceedances of the limit stated in Schedule 3 shall be notified to Natural Resources Wales as required under section 4.3 (Notifications) of the permit.

2.0 Background

There are a number of influential factors which can be attributed to the increased number of CO breaches, which makes it difficult to determine the most significant/leading factor. As a result, a number of engineering and process control measures are being implemented or

investigated for the feasibility of implementation to reduce the number of CO peaks experienced at the Melt Shop.

In August, continuous CO breaches occurred. It was discovered that there was a drop off in back pressure on oxygen, which in turn affected oxygen injection. However, the oxygen injection system was not alarmed and so the fault was not detected immediately. Oxygen flow rates and pressures are now part of the process control maintenance checks.

The primary focus of 2014 was production yield improvement to ensure financial security. This involved using increased charged carbon and carbon bearing material in the EAF process. This may have attributed to the increase in the frequency of CO breaches.

An investigation was undertaken to identify the most frequent causes of CO breaches using the CEMS analysis tools, shift reports and Melt Shop delay records. Following the results of this investigation, the Process and Production Manager have implemented or are proposing to implement the following control measures.

3.0 Engineering Control Measures

- *Electrodes* – the aim is reducing the duration of an electrode addition. Currently each electrode change takes 5 minutes. During this time, the emissions are drawn up to the roof canopy extraction system and onto the dedusting plant, thus reducing the potential for complete combustion to occur. Therefore, CO generation increases during these times. It is not possible to undertake an electrode addition whilst the basket is empty due to the increased safety risks. Access to the surrounding areas would have to be restricted (pit side) to ensure no personnel were in the area due to the suspended load. This control measure was deemed an unsafe option and therefore was discounted. However, the Furnace Manager is investigating the possibility of reducing the duration of the change by altering the storage position of the electrodes.
- *Ducting Repairs* – replace ducting and panels in the quench tower to prevent further water leaks to enable complete combustion of the off gases from the 4th hole extraction. These repairs will be implemented during the April shutdown and will incur significant investment.
- *Additional CO monitors* – investigating the feasibility of installing additional CO monitors in specific locations to try to localise monitoring to identify direct source of CO and implement process control measures. Temporary installation for approx 2 weeks is planned.
- *CEMS equipment* – an evaluation of the current equipment and the potential to replace with a new monitor and keep the existing as a backup if a failure were to occur.

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4.0 Process Control Measures

- *Scrap blends* – the possibility of reducing the number of scrap blends from 8 to 3 is currently being investigated. This should stabilise the process and CELSA can then be more selective during scrap purchasing and reduce the variation between scrap mixes. This will enable greater control over carbon content and subsequent CO emissions.
- *Incinerated scrap* – trials have been undertaken using incinerated scrap (renewable energy combustion process). Early indications from the Expert Furnace System Optimization Process (EFSOP), which measures the gases straight from the furnace, show a reduction in CO emissions using this incinerated scrap. Additional trials will be undertaken to assess the impact on yield, energy consumption and power on time.
- *Turnings* – these were once delivered to the furnace directly from the scrap yard which resulted in damp turnings being processed through the furnace. Subsequently they are now stored and dried in the old Melt Shop building prior to entering the furnace.
- *Decarborisation* – oxygen efficiency expert assessment. Oxygen decarborising peaks at the end of the refine stage. Looking to add oxygen more consistently to reduce number of CO peaks.

5.0 Monitoring of CO Breaches

- The number and causes of CO breaches are investigated by the Shift Manager and reported to the EHS department at the earliest opportunity.
- During daily production meetings with all key personnel at the Melt Shop, this KPI (Key Performance Indicator) is discussed and tracked on the Melt Shop scorecard.

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6.0 Conclusions

Following the implementation of all of the above measures and once a feasibility assessment has been completed it should become more apparent which of these factors has the biggest influence on CO generation and which can be effectively controlled.

The above demonstrates that CELSA are looking at numerous opportunities and are committed to ensure the CO breaches are minimised in the first instance and eliminated in the long term.

We trust that this fulfils the requirements for the action identified in CAR 0222822 but if you require any further information or should have any further questions please do not hesitate to contact me.

Yours sincerely

Richard Lewis
Environmental Manager