

# **Review of an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010 (as amended)**

## **Decision document recording our decision-making process following review of a permit**

The Permit number is: EPR/ZP3935LP

The Operator is: Sheffield International Forgemasters Limited

The Installation is: Stainless Melting and Continuous Casting, PO Box 286, Brightside Lane, Sheffield, South Yorkshire S9 2RW

This Variation Notice number is: EPR/ZP3935LP/V008

### **What this document is about**

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication of updated decisions on BAT conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the iron and steel production industry sector published on 8<sup>th</sup> March 2012 and other relevant BAT Conclusions published prior to this date. This is our decision document, which explains the reasoning for the consolidated variation notice that we are issuing.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions ('BAT Conclusions') for Iron and Steel Production as detailed in document reference 2012/135/EU. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. It also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and philosophy and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have disappeared because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we

therefore address only our determination of substantive issues relating to the new BAT Conclusions.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

## **How this document is structured**

1. Our proposed decision
2. How we reached our decision
3. The legal framework
4. Annex 1- Review of operating techniques within the Installation against BAT Conclusions
5. Annex 2 – Improvement Conditions

# 1 Our decision

We have decided to issue the Variation Notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

## 2 How we reached our decision

### 2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under Regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 13/09/2013 requiring the Operator to provide information to demonstrate how the operation of their installation currently meets, or will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Notice also required that where the revised standards are not currently met, the operator should provide information that

- Describes the techniques that will be implemented before 08/03/2016 which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 08/03/2016, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 60 Notice requested that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 60 Notice response from the Operator was received on 30/04/2014.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

## 2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous regulatory activities with the facility we have no reason to consider that the operator will not be able to comply with the techniques and standards described in the BAT Conclusions.

### **3 The legal framework**

The Consolidated Variation Notice will be issued, under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

### Annex 1: decision checklist regarding relevant BAT Conclusions

BAT Conclusions for the Production of Iron Steel, were published by the European Commission on 8<sup>th</sup> March 2012. There are 95 BAT Conclusions. This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the Consolidated Variation Notice.

BAT Conclusion No	Summary of BAT Conclusion requirement	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
<b>General BAT</b>		
1	BAT is to implement and adhere to an environmental management system (EMS)	<p>Environmental Management System (EMS) has been in place since 2005 which meets the requirements of ISO14001:2004 and covers all of the elements and sub-elements outlined in BAT 1. Benchmarking is undertaken both internally across the site and with other electric arc furnaces.</p> <p>BAT is achieved.</p>
2	BAT is to reduce thermal energy consumption by using a combination of techniques.	<p>Noted that the BAT conclusion document refers certain techniques being important for integrated steelworks in order to improve the overall energy efficiency and we accept that the use of steam boilers for reheating furnaces, combined heat and power and the use of 'modern, gravimetric solid fuel feed systems' is not relevant.</p> <p>It is accepted that subsection BAT I relates to an integrated steelworks. SFIL has no automatic monitoring on the EAF melting process and parameters are not specifically measured. The melt is controlled manually by the Furnace Operator to a strict operational procedure. There are no automated controls on the VOD or LF. The VAD has a SCADA for viewing parameters but not for automated control. The Melt Shop bag</p>

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		<p>plant performance and status is monitored by SCADA. An automated meter reading (AMR) project is currently underway where comprehensive energy metering will be installed throughout the site to improve the monitoring of energy consumption, thereby giving increased control of energy and identifying areas and equipment. Phased energy efficiency programme starting with the roll out of electricity meters on key equipment, followed by gas and other metering as well as incorporating existing meters on to the system.</p> <p>Bat subsection II &amp; III. Not Applicable as specific batch processing and no gas pre-heating undertaken.</p> <p>BAT II-IV</p> <ul style="list-style-type: none"> <li>- Recovery of excess heat from processes is limited to an agreement with E.ON to take heat for the South Machine Shop (SMS) from the Lower Don Valley (LDV) District Heating Network that is currently under construction; heat should be available in 2015.</li> </ul> <p>Onsite steam generators are regularly maintained and their performance optimised.</p> <p>Steam pipes and hot water pipes are insulated to prevent heat loss. All reheat and heat treatment gas furnaces around the site (inc. Forge and Foundry) are individually metered and the majority are automatically controlled through their processes. SFIL have investigated the use of a closed loop control systems to optimise a series of input parameters to provide energy savings for electric arc furnaces. Whilst the cost of the</p>

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		<p>system is approximately £700,000 providing 15kWhr/tonne with a potential payback period of 6 years, SFIL argue that cost of the furnace hardware needed and computer software would be in the region of £5.5million, taking this into account the costs /benefit is deemed excessive</p> <p>We have included condition 1.2.1(b) to review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities</p> <p><b>Overall BAT will be achieved by 8<sup>th</sup> March 2016.</b></p>
3	<p>BAT is to reduce primary energy consumption by optimisation of energy flows and optimised utilisation of the extracted process gases such as coke oven gas, blast furnace gas and basic oxygen gas.</p> <p>Process integrated techniques to improve energy efficiency in an integrated steelworks by optimising process gas utilisation include:</p>	<p>BAT conclusion 3 is not applicable as the site does not have any coke oven gas, blast furnace gas or basic oxygen gas.</p>

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4	<p>BAT is to use desulphurised and dedusted surplus coke oven gas and dedusted blast furnace gas and basic oxygen gas (mixed or separate) in boilers or in combined heat and power plants to generate steam, electricity and/or heat using surplus waste heat for internal or external heating networks, if there is a demand from a third party.</p>	<p>BAT conclusion 4 is not applicable as it relates to an integrated steel works and the site does not produce coke oven gas, blast furnace gas or basic oxygen gas.</p>
5	<p>BAT is to minimise electrical energy consumption by using one or a combination of the following techniques:</p> <ul style="list-style-type: none"> <li>I. power management systems</li> <li>II. grinding, pumping, ventilation and conveying equipment and other electricity-based equipment with high energy efficiency.</li> </ul>	<p>As described above in BAT2 BAT I – Power Management - An automated meter reading (AMR) project is underway. In addition SFIL’s operations are covered under two separate EU Emissions Trading Scheme (EUETS) which detail long term agreements, energy reduction measures and targets in place; performance against these is independently verified.</p> <p>BAT II). High energy efficiency equipment such as inverters on the VAD cooling is used on site. SFIL are committed to realising the improvements of the AMR project.</p> <p>As improvements can be made we have included condition 1.2.1(b) which requires energy recovery to be reviewed every 4 years. The Operator is required to report energy usage and energy generated under condition 4.2 of Schedule 4.</p>



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6	<p>BAT is to optimise the management and control of internal material flows in order to prevent pollution, prevent deterioration, provide adequate input quality, allow reuse and recycling and to improve the process efficiency and optimisation of the metal yield.</p>	<p>All internally produced scrap is graded by SFIL's Technical Department, logged and returned to the scrap yard on a constant basis. Have an on-site scrap stock quantities and grades are constantly logged, and segregated on the scrap yard. Stocks between 2,000-4,000 tonnes only.</p> <p>All alloys are delivered to and stored inside the Melt Shop. Diffuse dust is contained within the building and materials are not exposed to the rain and so runoff is not an issue.</p> <p>Scrap yard and scrap storage – discussed later under BAT 7.</p> <p><b>Bat is achieved.</b></p>
7	<p>BAT is to select appropriate scrap qualities and other raw materials. scrap sorting to minimise the risk of including hazardous or non-ferrous contaminants, particularly polychlorinated biphenyls (PCB) and oil or grease.</p>	<p>Due to the high quality product requirements and high value integrity solutions being delivered (for example, pressure vessels and civil nuclear components), SFIL only high grade scrap is used. Such scrap will not contain mercury or materials that may lead to the formation of PCDD/F or PCBs.</p> <p>Scrap purchasing and control is covered in by a Quality Procedure SP009 with acceptance criteria specifications, dealing with unsuitable scrap etc. Melt testing takes place regularly to test quality. Radiation detection takes place on the weigh bridge when scrap is being delivered on to site and quarantined when identified. Further testing for radiation is conducted on samples taken from the EAF; this is detailed in Quality Procedure WOP708. Radiation detection also takes</p>

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		<p>Whilst only a third of the scrap yard is concreted – this is used for potentially contaminated scrap (e.g. oil contaminated turnings). Run off from the scrap yard hard standing area is via silt trap before discharge to sewer. This is inspected and cleaned out periodically.</p> <p><b>Bat achieved</b></p>
8	<p>BAT for solid residues is to use integrated techniques and operational techniques for waste minimisation by internal use or by application of specialised recycling processes (internally or externally).</p>	<p>Minimal slag handling is carried out on the SFIL site. The slag operations are carried out by Harsco Ltd dust from the Forge Burning Booth, Shot Blast and Melt Shop Burning Booth are recovered through the EAF, depending on the amount and product quality standards. See BAT 90 and 93</p>
9	<p>BAT is to maximise external use or recycling for solid residues which cannot be used or recycled according to BAT 8, wherever this is possible and in line with waste regulations. BAT is to manage in a controlled manner residues which can neither be avoided nor recycled.</p>	<p>Approximately 93% of its waste is recovered, with just 7% to landfill. EAF dust goes for disposal at an underground storage landfill in the UK due to high zinc content, SFIL are investigating sending very low in zinc (15-20%), to Poland for recovery. Aim is to achieve 100% recovery by end of 2014.</p> <p>Refractory – no recovery of refractory takes place as the integrity of the bricks is affected. All waste refractory material is sent off site to a specialist approved company where it is sorted, segregated, reprocessed and reused. Melt shop specific waste discussed further / again in BAT 93.</p> <p><b>Bat is achieved</b></p>

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10	BAT is to use the best operational and maintenance practices for the collection, handling, storage and transport of all solid residues and for the hooding of transfer points to avoid emissions to air and water.	<p>Limited solid residues are produced - Slagging &amp; Ladle knockout to remove spent refractory bricks operations are carried out inside the Melt Shop. SE BAT 93.</p> <p><b>Bat achieved</b></p>
11	BAT is to prevent or reduce diffuse dust emissions from materials storage, handling and transport	<p>A fugitive dust management strategy is in operation. SFIL considers that diffuse emissions are largely controlled by a combination of techniques.</p> <p><b>Bat achieved</b></p>
12	BAT for waste water management is to prevent, collect and separate waste water types, maximising internal recycling and using an adequate treatment for each final flow.	<p>SFIL have undertaken an extensive review of waste water management as described in the regulation 60 response. Areas of improvement have been identified looking at alternate filtration method to allow the use of river water rather than potable water in the Forge. Area also looking to treat / filter the discharge water which is emitted to sewer via discharge point S1 thereby allowing reticulation.</p> <p>Treated and untreated water are mostly kept separate. The scrap yard has a silt trap and interceptor in place to take runoff from the scrap yard hard standing area before discharge to sewer. The interceptor to the rear of the forge discharges to Bagley Brook (emission point W7)</p> <p><b>BAT is achieved</b></p>

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13	<p>BAT is to measure or assess all relevant parameters necessary to steer the processes from control rooms by means of modern computer-based systems in order to adjust continuously and to optimise the processes online, to ensure stable and smooth processing, thus increasing energy efficiency and maximising the yield and improving maintenance practices.</p>	<p>There is currently no automatic monitoring on the EAF melting process control is via a strict operational procedure.</p> <p>No off-gas / pre-combustion monitoring on the EAF for control of combustion is undertaken.</p> <p>The Melt Shop bag plant performance and status is monitored by SCADA.</p> <p><b>BAT is achieved</b></p>
14	<p>BAT is to measure the stack emissions of pollutants from the main emission sources from all processes included in the Sections 1.2 – 1.7 whenever BAT-AELs are given and in process gas-fired power plants in iron and steel works.</p> <p>BAT is to use continuous measurements at least for:</p> <ul style="list-style-type: none"> <li>• emissions of nitrogen oxides (NO<sub>x</sub>) from power plants</li> <li>• dust emissions from large electric arc furnaces.</li> </ul> <p>For other emissions, BAT is to consider using continuous emission monitoring depending on the mass flow and emission characteristics.</p>	<p>This is not an integrated steel works, no requirement for continuous measurements of emissions of nitrogen oxides (NOX) from power plants.</p> <p>The current permit already requires continuous dust emissions monitoring of the electric arc furnace.</p> <p><b>Bat is achieved</b></p>

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15	<p>For relevant emission sources not mentioned in BAT 14, BAT is to measure the emissions of pollutants from all processes included in the Sections 1.2 – 1.7 and from process gas-fired power plants within iron and steel works as well as all relevant process gas components/pollutants periodically and discontinuously. This includes the discontinuous monitoring of process gases, stack emissions, polychlorinated dibenzodioxins/furans (PCDD/F) and monitoring the discharge of waste water, but excludes diffuse emissions</p>	<p>The permit already specifies self-monitoring programme for air and waste water emissions. See Tables S3.1 Emission to Air &amp; S3.2 Emissions to Water of the permit.</p> <p>For the Melting Shop, Bag Filter plant roof vents stack A1 we have set a limit for Mercury and its compounds of 0.05 mg/m<sup>3</sup> and required annual periodic monitoring.</p> <p>As emissions to water and sewer consist of cooling and quench water with no process waters no limits have been set, and additions. These are currently tested as spot samples on a quarterly basis.</p>

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16	<p>BAT is to determine the order of magnitude of diffuse emissions from relevant sources by the methods</p> <ul style="list-style-type: none"> <li>• Direct measurement methods where the emissions are measured at the source itself.</li> <li>• Indirect measurement methods where the emission determination takes place at a certain distance from the source;</li> <li>• Calculation with emission factors.</li> </ul>	<p>Combinations of methods (direct and calculated with emission factors) are used. Mass emissions of NOx are calculated through the measurement of representative furnaces and boilers, derivation of NOx factors and application of this to total gas use on all furnaces.</p> <p>Point source emissions of particulates are measured directly (as per permit) and mass emissions calculated. Emissions from EAF bag plant are measured directly and mass emissions calculated.</p> <p>Fugitive dust emissions are estimated based on results taken from annual respirable dust (occupational health) testing. As little work has been done to examine what further steps can be taken to reduce diffuse emissions we have set an improvement condition IC1.</p>
17	BAT is to prevent pollution upon decommissioning	<p>A decommissioning plan is in place as part of the site condition report and meets site condition reports and baseline reporting under IED– guidance and templates (H5) and BAT guidance. All new equipment is designed with BAT.</p> <p><b>BAT achieved</b></p>
18	BAT is to reduce noise emissions from relevant sources in the iron and steel manufacturing	An approved noise management plan is in place. No complaints have been received regarding noise.

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	processes	<b>BAT is achieved</b>
<b>BAT Conclusions for Sinter Plant</b>		
BAT conclusions 19 to 32 inclusive	This is not an integrated steel works. There is no sinter plant at the installation. Therefore, BAT Conclusions 19 to 32 inclusive are not relevant for this installation.	<b>BATC 19 to 32 not relevant.</b>
<b>BAT Conclusions for Pelletisation Plants</b>		
BAT Conclusions 33 to 41 inclusive	There are no Pelletisation plants in the U.K. Therefore, BAT Conclusions 33 to 41 inclusive are not relevant for this installation.	<b>BATC 33 to 41 not relevant</b>
<b>BAT Conclusion for Coke Oven Plants</b>		
BAT Conclusions 42-58 inclusive	There are no coke oven plants at the installation. Therefore, BAT Conclusions 42-58 inclusive are not relevant for this installation	<b>BATC 42 to 58 not relevant</b>
<b>BAT Conclusions for Blast Furnaces</b>		
BAT Conclusions	This is not an integrated steel works. There are blast furnaces at the installation. Therefore, BAT	<b>BATC 59 to 74 not relevant</b>

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59-74 inclusive	Conclusions 59-74 inclusive are not relevant for this installation	
<b>BAT Conclusions for Basic Oxygen Steelmaking and Casting</b>		
BAT Conclusions 75-86 inclusive	This not integrated steel works. No Basic Oxygen Steelmaking and Casting is undertaken at the installation. Therefore, BAT Conclusions 75-86 inclusive are not relevant for this installation	<b>BATC 75 to 86 not relevant</b>
<b>BAT Conclusions for Electric Arc Furnace Steelmaking and Casting</b>		
87	BAT for the electric arc furnace (EAF) process is to prevent mercury emissions by avoiding, as much as possible, raw materials and auxiliaries which contain mercury (see BAT 6 and 7)	As described in BAT 6 & 7 above raw materials and auxiliaries' selection without mercury.  <b>BAT is achieved.</b>
88	BAT for the electric arc furnace (EAF) primary and secondary dedusting (including scrap preheating, charging, melting, tapping, ladle furnace and secondary metallurgy) is to achieve an efficient extraction of all emission sources by using one of the techniques listed below and to use subsequent dedusting by means of a bag filter: I. a combination of direct off-gas extraction (4th or 2nd hole) and hood systems II. direct gas extraction and doghouse systems	In line with Bat the following techniques are used for primary and secondary dedusting: I. Use of 4th hole extraction from the electric arc furnace (EAF) II. Direct gas extraction from the electric arc furnace (EAF) is employed but space constraints do not allow dog leg system  • Direct extraction from the argon oxygen carburiser vessel (AOD), direct extraction from the ladle arc furnace (LAF) and total building evacuation of the



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	<p>III. direct gas extraction and total building evacuation (low-capacity electric arc furnaces (EAF) may not require direct gas extraction to achieve the same extraction efficiency).</p> <p>The overall average collection efficiency associated with BAT is &gt; 98 %.</p> <p>The <b>BAT-associated emission level for dust is &lt; 5 mg/Nm<sup>3</sup></b> , determined as a daily mean value.</p> <p>The <b>BAT-associated emission level for mercury is &lt; 0.05 mg/Nm<sup>3</sup></b> , determined as the average over the sampling period (discontinuous measurement, spot samples for at least four hours).</p>	<p>steelmaking building (encompassing charging, melting, tapping and de-slagging operations)</p> <p>The Melt Shop bag plant is efficient and captures 99.70% of fume extracted (based on last 5 years data).</p> <p>Review of the continuous monitoring results for last year 2012 - 2013 of dust emissions from EAF bag plant confirms that there have been no instances of the emissions above 5mg/m<sup>3</sup> as a daily mean average and the BAT-AEL is already met.</p> <p>Review of the periodic monitoring results of mercury emissions are shown to be below the BAT AEL of &lt;0.05mg/m<sup>3</sup>.</p> <p><b>BAT AEL is achieved.</b></p>
89	<p>BAT for the electric arc furnace (EAF) primary and secondary dedusting (including scrap preheating, charging, melting, tapping, ladle furnace and secondary metallurgy) is to prevent and reduce polychlorinated dibenzodioxins/furans (PCDD/F) and polychlorinated biphenyls (PCB) emissions by avoiding, as much as possible, raw materials which</p>	<p>As discussed in BAT 6 &amp; 7 above the selection of raw materials minimises dioxins. In addition BAT I &amp; II is undertaken</p> <p>The annual spot sample test for polychlorinated dibenzodioxins/ furans (PCDD/F) is 0.005 ng I-TEQ/m<sup>3</sup> which is well under BAT AEL &lt;0.1ng ITEQ/m<sup>3</sup>, though the sampling is only taken over 4hrs rather than 6-8hrs.</p>

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	<p>contain PCDD/F and PCB or their precursors (see BAT 6 and 7) and using one or a combination of the following techniques, in conjunction with an:</p> <ol style="list-style-type: none"> <li>I. appropriate dust removal system: appropriate post-combustion</li> <li>II. appropriate rapid quenching</li> <li>III. injection of adequate adsorption agents into the duct before dedusting.</li> </ol> <p>The BAT-associated emission level for polychlorinated dibenzodioxins/furans (PCDD/F) is &lt; 0.1 ng I-TEQ/Nm<sup>3</sup>, based on a 6 – 8 hour random sample during steady-state conditions. In some cases, the BAT-associated emission level can be achieved with primary measures only.</p>	<p>In table S3.1 we have set reference period of the monitoring of dioxins and furans (ITEQ) to a minimum 6 hour; maximum 8 hour in line with BAT</p> <p><b>BAT is achieved</b></p>
90	<p>BAT for on-site slag processing is to reduce dust emissions by using one or a combination of the following techniques:</p> <ol style="list-style-type: none"> <li>I. efficient extraction of the slag crusher and screening devices with subsequent off-gas cleaning, if relevant</li> <li>II. transport of untreated slag by shovel loaders</li> <li>III. extraction or wetting of conveyor transfer points for broken material</li> <li>IV. wetting of slag storage heaps</li> </ol>	<p>The activity is undertaken by a third party Harsco Ltd.</p> <ol style="list-style-type: none"> <li>I. Not applicable no slag crushing or screening operations is under taken.</li> <li>II. Shovel loaders are used to move slag from under the furnace in to adjacent bays inside the Melt Shop.</li> <li>III. Not applicable no slag conveyors on site.</li> <li>IV. Slag piles are treated with water spraying in the pens for dust suppression.</li> </ol>

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	<p>V. use of water fogs when broken slag is loaded. In the case of using BAT I, the BAT-associated emission level for dust is &lt; 10 – 20 mg/Nm<sup>3</sup> , determined as the average over the sampling period (discontinuous measurement, spot samples for at least half an hour).</p>	<p>IV. Slag loaded in high sided lorries inside the Melt Shop building.</p> <p><b>BAT is achieved</b></p>
91	<p>BAT is to minimise the water consumption from the electric arc furnace (EAF) process by the use of closed loop water cooling systems for the cooling of furnace devices as much as possible unless once-through cooling systems are used.</p>	<p>EAF furnace has a “once through” pumped system abstracted and returned straight to the River Don. For the secondary steel making units river water is used to top up the 3 cell VAD, VOD and stream degassing vacuum ejector system cooling tower. . The cooling system is closed loop, cooling water condensate from this cooling tower is discharged to sewer via permitted emission point S3.</p> <p>The VAD, VOD, EAF and LF closed loop water cooling systems.</p> <p><b>BAT is achieved.</b></p>
92	<p>BAT is to minimise the waste water discharge from continuous casting by using the following techniques in combination:</p> <p>I. the removal of solids by flocculation, sedimentation and/or filtration</p> <p>II. the removal of oil in skimming tanks or in any other effective device</p>	<p>Continuous casting is not undertaken on site.</p> <p><b>BAT 92 is not applicable.</b></p>

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	<p>III. the recirculation of cooling water and water from vacuum generation as much as possible.</p> <p>The BAT-associated emission levels, for waste water from continuous casting machines, based on a qualified random sample or a 24-hour composite sample, are:</p> <ul style="list-style-type: none"> <li>— suspended solids &lt; 20 mg/l</li> <li>— iron &lt; 5 mg/l</li> <li>— zinc &lt; 2 mg/l</li> <li>— nickel &lt; 0.5 mg/l</li> <li>— total chromium &lt; 0.5 mg/l</li> <li>— total hydrocarbons &lt; 5 mg/l</li> </ul>	
93	<p>This relates to production residues and specifically states that BAT is to prevent waste generation. It also makes reference to a number of techniques and BAT is to manage in a controlled manner EAF process residues which can neither be avoided nor recycled.</p>	<p>See also BAT 8 above.</p> <p>Different waste streams are collected, segregated and stored on site as appropriate to facilitate recovery or disposal route via this route by the end of 2014.</p> <p><b>Bat is achieved</b></p>
94	<p>BAT is to reduce energy consumption by using continuous near net shape strip casting, if the quality and the product mix of the produced steel grades justify it.</p>	<p>Continuous near net shape strip casting is not undertaken product mix does not allow this to take place. BAT 94 is not applicable.</p>

<b>BAT Conclusion No</b>	<b>Summary of BAT Conclusion requirement</b>	<b>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</b>
95	BAT is to reduce noise emissions from electric arc furnace (EAF) installations and processes generating high sound energies by using a combination of the following constructional and operational techniques depending on and according to local conditions (in addition to using the techniques listed in BAT 18):	As described above in BAT18 – the site has an approved noise management plan.

Where relevant and appropriate, we have incorporated the techniques described by the Operator in their Regulation 60 Notice response as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the Consolidated Variation Notice.

### Annex 3: Improvement Conditions

Based in the information in the Operators Regulation 60 Notice response and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These additional improvement conditions are set out below - justifications for them are provided at the relevant section of the decision document (Annex 1).

Reference	Improvement measure	Completion date
IC1	<p>Based on the outcome of the assessments of emissions of PM<sub>10</sub> and NO<sub>2</sub> from the installation on the environment; the Operator shall produce an action plan for the further reduction of the total installation NO<sub>2</sub> and PM<sub>10</sub> particulate environmental process contribution. The report shall include but need not be limited to a review covering:</p> <p>Options reviewed related to balance of the benefits of individual furnace stacks relative to multi flue stack design (consideration of environmental benefit relative to economic and feasibility issues)</p> <p>Optimum stack positioning and height with regard to existing plant restrictions.</p> <p>Furnace improvements in line with indicative BAT measures.</p> <p>Furnace operating conditions balancing optimum performance and NO<sub>x</sub> emissions including Furnace oxygen levels and air pre-heating temperatures.</p> <p>The action plan should include timescale and evidence of incremental process contribution improvements, where possible, for measures listed in the action plan. The measures detailed in the report shall be implemented by the Operator from the date of approval in writing by the Environment Agency.</p>	<p>Scoping report within 3 months of issue of variation EPR/ZP3935LP/V008</p> <p>Action Plan within 12 of issue of same variation</p>