

This form will report compliance with your permit as determined by an NRW officer

Site	Tata Steel Port Talbot steelworks	Permit Ref	BL7108IM (as amended)
Operator/ Permit holder	Tata Steel UK Ltd		
Date	10 July 2014	Time in	09.30 Out 11.30
What parts of the permit were assessed	Blast Furnace No.4 bleeder valve event 3 July 2014 See below for details of assessment		
Assessment	EPR - inspection	EPR Activity:	Installation X Waste Op Water Discharge
Recipient's name/position	Jason Heatman, Lead Environmental Engineer, Tata Steel Port Talbot		
Officers names	DMP Broom & DE Cowie	Date issued	19 December 2014

Section 1 - Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations. A detailed explanation and any action you may need to take are given in the "Detailed Assessment of Compliance" (section 3). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our [Compliance Classification Scheme](#) (CCS). CCS scores can be consolidated or suspended, where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your [local office](#).

Permit Conditions and Compliance Summary
Condition(s) breached

a) Permitted activities	1. Specified by permit	A	
b) Infrastructure	1. Engineering for prevention & control of pollution	N	
	2. Closure & decommissioning	N	
	3. Site drainage engineering (clean & foul)	N	
	4. Containment of stored materials	N	
	5. Plant and equipment	A	Further information is required
c) General management	1. Staff competency/ training	N	
	2. Management system & operating procedures	A	
	3. Materials acceptance	N	
	4. Storage handling, labelling, segregation	N	
d) Incident management	1. Site security	N	
	2. Accident, emergency & incident planning	A	
e) Emissions	1. Air	A	
	2. Land & Groundwater	N	
	3. Surface water	N	
	4. Sewer	N	
	5. Waste	N	
f) Amenity	1. Odour	N	
	2. Noise	A	
	3. Dust/fibres/particulates	A	
	4. Pests, birds & scavengers	N	
	5. Deposits on road	N	
g) Monitoring and records, maintenance and reporting	1. Monitoring of emissions & environment	A	
	2. Records of activity, site diary, journal & events	A	
	3. Maintenance records	N	
	4. Reporting & notification	A	
h) Resource efficiency	1. Efficient use of raw materials	N	
	2. Energy	N	

KEY: C1, C2, C3, C4 = CCS breach category (*suspended scores are marked with an asterisk),
A = Assessed or assessed in part (no evidence of non-compliance), N = Not assessed, NA = Not Applicable

Number of breaches recorded

0

Total compliance score
(see section 5 for scoring scheme)

0

If the Total No Breaches is greater than zero, then please see Section 3 for details of our proposed enforcement response

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- the part(s) of the permit that were assessed (e.g. maintenance, training, combustion plant, etc)
- where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- any non-compliances identified
- any non-compliances with directly applicable legislation
- details of any multiple non-compliances
- information on the compliance score accrued inc. details of suspended or consolidated scores.
- details of advice given
- any other areas of concern
- all actions requested
- any examples of good practice.
- a reference to photos taken

Site description

Tata Steel UK Ltd (Tata) operates an integrated iron and steel works at Port Talbot, Neath Port Talbot. The site is permitted as an installation under the Environmental Permitting Regulations (EPR). The steelworks has several identifiable permitted processes which are carried out sequentially across the installation to convert raw iron ores and coal to semi finished (slab) and finished steel products (such as hot rolled, pickled and oiled, cold rolled and annealed). The permit also covers coke making and the reception, stockpiling and blending of raw iron making materials. Two other companies, Cambrian Stone and Harsco, undertake separately-permitted slag handling and iron plating activities at the steelworks on Tata's behalf.

Purpose of visit/assessment

At 10.10hrs on 3 July 2014 a bleeder valve opened on Blast Furnace No.4 at Port Talbot steelworks. Following this event a number of Port Talbot residents notified Natural Resources Wales to complain of noise and visual emissions from the furnace. The aim of this intervention was to review this event and any activities that happened leading up to the bleeder valve opening. This was a joint inspection with the Health & Safety Executive (HSE) as the release of blast furnace gas could have implications under the Control Of Major Accidents & Hazards (COMAH) Regulations.

Person(s) present (Office based)

Tata Steel	Richard Leonard	NRW	Mark Broom
	Dean Cartwright		Doug Cowie
	Marion Davies	HSE	Alan Strawbridge
	Jason Heatman		
	Andrew Townsend		
	Anthony Dede-Benefor		
	Mark Wall		
	Dave Thomson		

Background

The blast furnaces at Port Talbot operate at up to 1.5 bar (top furnace pressure). The pressure inside the furnace is regulated by controlling the gas flow through the gas cleaning plant using a 'Davy' cone, which throttles the gas flows out of the cleaning plant. Each furnace has four 'bleeder' valves – pressure relief valves – which are set as follows:

Bleeder	North	South	Centre	Semi-clean
Opening pressure above furnace top control pressure (hydraulic)	0.39 bar	0.4 bar	0.45 bar	0.5 bar
Absolute opening pressures (mechanical)	1.89 bar	1.96 bar	1.95 bar	2.0 bar

The north, south and centre bleeders are at the top of the furnace. The semi clean bleeder comes from the gas cleaning plant.

The bleeder valves are automatically opened and closed using a hydraulic system. If the control point of the furnace is 1.2 bar, sensors associated with the bleeders measure the pressure at the furnace top which is then used by the computer system at Blast Furnace Control to regulate the furnace pressures. Bleeder openings normally last between 2 – 5 seconds, but gases are released at high speed which normally results in smoke and a loud noise.

In addition to the hydraulic system there is a mechanical spring system that opens at the 'absolute' rather than the control point pressures. In the unlikely event the absolute opening pressure reaches 2.35 bar, this system will activate all four bleeder valves.

Furnace operation

Alternating layers of iron making materials are added to the furnace. These materials are consumed as they move down the furnace, becoming molten iron and slag which is tapped off near the base. It is important to control furnace operations so that there is a steady flow or drop of the solids and to ensure that air blown into the furnace through the tuyere nozzles forms good and long 'raceways' towards the centre of the furnace. The gases produced at tuyere level should pass up the centre and pass out of the furnace top under the control of the Davy cone in the gas cleaning plant.

It takes around 6 seconds for gas blown into the furnace to exit the furnace top and around 6 hours for the materials added to the top of the furnace to come out as slag and iron at the furnace tapholes. Hot air (known as 'blast') is blown into the furnace from the stoves. The hot blast is blown through a circular ring (called the bustle pipe) around the furnace and then into it through 32 tuyeres. The air (or wind as it is called) comes from a steam-driven turbo blower at the power plant. Lastly, the pressure at the bottom of the furnace is greater than at the top due to the back pressure from the solid raw materials and the high volumes of hot air being blown into the furnace through the tuyeres.

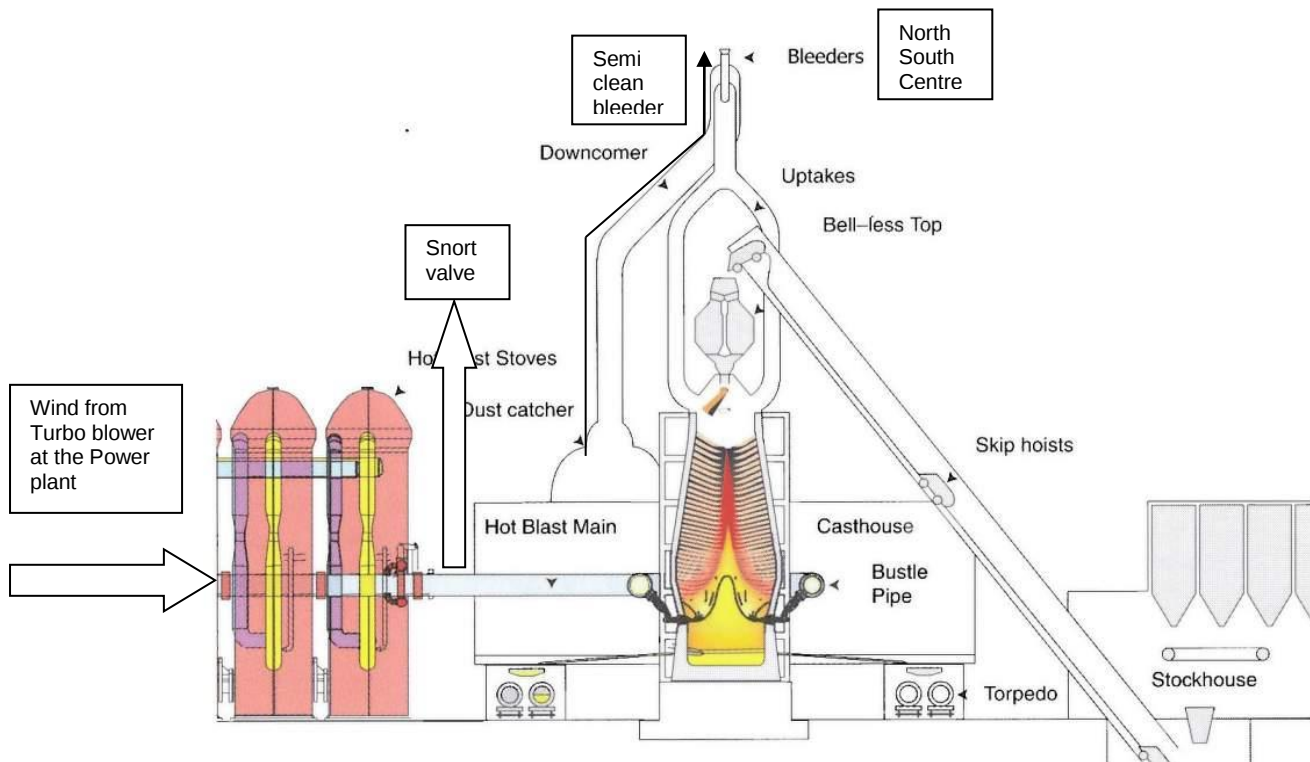


Figure 6: Blast furnace general arrangement

Bleeder valve opening on No. 4 Furnace

At 10.10hrs on the 3 July 2014, three bleeders on No.4 Furnace opened (North, South and Centre bleeders). After two seconds the South and Centre bleeders shut, but the North bleeder remained open releasing a large cloud of black smoke, sporadic flames and a loud noise. When the bleeders open the standard response is to reduce the wind being blown into the furnace. To do this the duty operator opens a 'snort' valve positioned on the hot blast main. In this case the snort valve was fully opened in an attempt to reduce the impact of the bleeder opening. It is not realistic to expect the snort valve to always be activated prior to a bleeder opening, as furnace pressure increases can occur in a matter of seconds.

After almost 3 minutes the power plant reduced the wind (air supply) that comes from the turbo blower by reducing the blower to minimum speed. This brought down the furnace pressure and reduced the emissions from the top of the furnace. In the meantime an operator climbed up the furnace to the material gate level and activated an auxiliary manual hydraulic system that shut the north bleeder. The north bleeder was shut 8 minutes after it had opened.

Tata has estimated that 5 tonnes of blast furnace gas and between 100 and 200 kg of dust was released during this event. Assuming that blast furnace gas is defined as 'toxic' under the COMAH Regulations, then this release was below the 5% top tier threshold (10 tonnes) for reporting to the European Commission (EC). Although not COMAH-reportable in its own right, this incident may be notifiable under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). No high levels of carbon monoxide (CO) were detected by the ring of CO monitors around the edge of the steelworks. This network forms part of the COMAH alarm system for the steelworks and the results were as expected when examined in the context of CO dispersion modelling work. Tata Steel notified Natural Resources Wales during the incident that they had a problem – this is in accordance with the company's environmental permit.

Reason for the bleeder staying open

Each bleeder valve needs hydraulic power to open and then again to drive it shut. Examination of the valve mechanism by Tata found that a solenoid coil in the valve system failed which prevented the valve being driven shut. The solenoid coil is a sealed unit which has a continuous power rating and is not designed to require intrusive maintenance. Each valve is tested for opening and shutting when the furnace comes out of production during a stop – normally once per calendar quarter. No. 4 Furnace came out of production recently for a short stop and it has since returned to production.

The other bleeder valves at Port Talbot are all of similar design and operation. No previous problems have been found with these valves or their solenoid coils. Tata will take out a similar coil system during the next furnace stop to see if there is a generic problem with these valves and coils or if it is a one-off.

Events leading up to the bleeder opening

The day before the bleeder opening the furnace was stable and there was a consistent rise and fall of the burden level in the furnace. There was a clear difference between the maximum output pressure and the operational furnace pressure of the furnace, showing that the furnace was not being pushed too hard in terms of its production capacity.

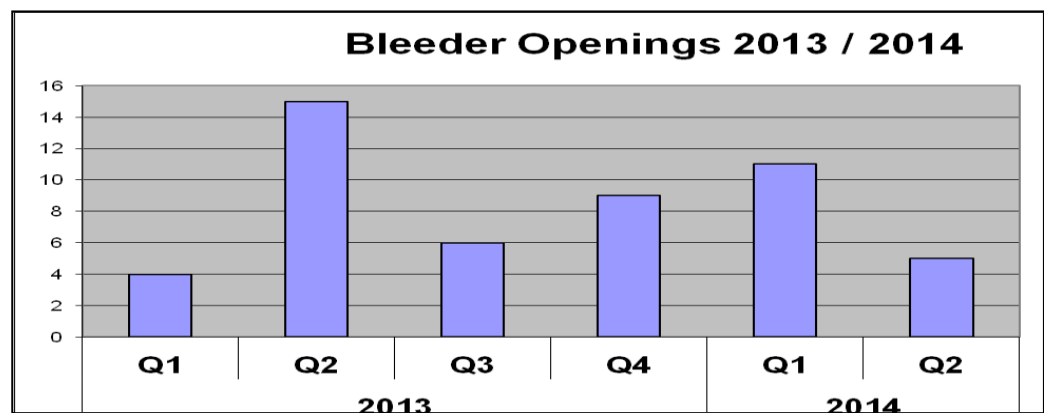
Around 23.00hrs on 2 July 2014 the furnace had suspend iron production on No.4 Furnace because of a problem with casting on the south casthouse taphole. The furnace was being brought back to a stable operation when a second suspension at around 08.00hrs on 3 July 2014 was needed because of another casting delay. Both delays were caused by communication problems between the Programmable Logic Controller (PLC) and the clay gun and drills on the cast house floor. The second problem caused an inter-cast time of 45 minutes during which the liquid iron and slag level inside the furnace started to rise. As the liquid level in the furnace rises, the flame length in the raceway shortens and the gases inside the furnace can start to track up the walls of the furnace rather than up the centre.

At around 10.10hrs there was a 'slip' inside the furnace causing the raw materials (the burden) to drop by approximately 3 metres. If the gases inside the furnace were travelling up the centre of the burden, this slip would not have caused the bleeders to open. However some furnace gases were tracking up the walls and the sudden burden drop caused a gas pressure wave up the sides of the furnace which caused the bleeder valves to open.

The actions taken by the furnace operators during the bleeder opening event (opening the snort valve, instructing the power plant to reduce the 'wind' and manually shutting the bleeder at high level in the furnace) were all aimed at minimising the impact of the open bleeder.

The common problem that led to both pauses concerned the communication system between the plc controller and the cast house floor. At No.4 Furnace a fibre-optic system is used to direct the clay guns and drills at the tapholes; this system experienced problems on 2 & 3 July 2014. Tata has investigated this issue and plans to replace the fibre-optics with a hard-wired system during the next furnace stop. This is proven technology and has been used at No.5 Furnace for many years.

We have begun to examine this event on 03/07/14 in the context of wider blast furnace environmental performance since Q1 of 2013. The frequency of bleeder openings is slightly less this quarter compared to previous levels. The high levels seen in Q2 2013 were due to problems with a temporary lining used to commission No.4 Furnace.



Actions taken by Tata since the bleeder opening

Tata has reviewed its procedures to respond to high liquid levels inside the furnace and reviewed this incident with its cast house and control room operators. The company has also checked all the bleeder valves on No. 4 furnace and confirmed they are working normally. An investigation into why the solenoid coil failed has commenced and was ongoing at the time of inspection.

Tata UK is undertaking a wider project for both Scunthorpe and Port Talbot steelworks which is looking at improving process stability and minimising bleeder openings. Furnace performance at both sites has been compared, although different burden types are used at each site and analysis of the data collected so far does not suggest a common link. As part of this project, a 'bow-tie' analysis of the circumstances leading to bleeder releases has been undertaken. The inspecting officers were shown a diagram illustrating this during the inspection.

Conclusions and further actions required

No permit non-compliances were found as a result of this incident even though the incident caused noise and dust releases that affected some local residents. As a result no compliance scores can be attributed to the inspection criteria F2 and F3. Tata notified this event to NRW according to its permit conditions.

This event is not a COMAH EC reportable event, but it is COMAH-relevant and may be reportable under RIDDOR.

For inspection criteria B5, [further information is required concerning the root cause of the solenoid coil failure. Once Tata's investigation has concluded a summary of its findings should be communicated to the inspecting officers.](#)

[The procedures in place at the time of the incident to control and manage liquid levels in the furnace need to be inspected and reviewed by Natural Resources Wales during a future compliance visit \(to be arranged\).](#) The operating pressures in the furnaces have not been increased and the furnace in the run up to this event has been operating below maximum theoretical pressures.

[Tata should be asked to review this event in the context of previous bleeder releases to see if there are any common causes that can be remedied to reduce the risk of future bleeder openings.](#) Natural Resources Wales will continue its review of historic bleeder records once it has received the quarterly report for April, May and June 2014 – which is due to be submitted by the end of July. NRW will consider what further actions could be needed after it has reviewed this in conjunction with Tata's procedures for managing liquid levels in the furnace.

[END OF SECTION 2]

	EPR Compliance Assessment Report	Report ID: 05643
This form will report non-compliance with your permit as determined by an NRW officer		
Site	Tata Steel Port Talbot steelworks	Permit
Operator/ Permit	Tata Steel UK Ltd	Date
		BL7108IM (as amended) 10 July 2014

Section 3- Enforcement Response		Only one of the boxes below should be ticked
You must take immediate action to rectify any non-compliance and prevent repetition. Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.		
Other than the provision of advice and guidance, at present we do not intend to take further enforcement action in respect of the non-compliance identified above. This does not preclude us from taking enforcement action if further relevant information comes to light or advice isn't followed.		n/a
In respect of the above non-compliance you have been issued with a warning. At present we do not intend to take further enforcement action. This does not preclude us from taking additional enforcement action if further relevant information comes to light or offences continue.		n/a
We will now consider what enforcement action is appropriate and notify you, referencing this form.		n/a

Section 4- Action(s)			
Where a non - compliance has been detected and an enforcement response has been selected above, this section summarises the steps you need to take to return to compliance and also provides timescales for this to be done.			
Criteria Ref.	CCS Category	Action Required/Advised	Due Date
See Section 1 above			
B5	N/A	Action 1: Further information is required concerning the root cause of the solenoid coil failure. The operator needs to supply a summary of its findings to the inspecting officers.	31 January 2015
N/A		Recommendation 1: The procedures in place at the time of the incident to control and manage liquid levels in the furnace need to be inspected and reviewed by Natural Resources Wales.	Next compliance visit to Iron making/Blast Furnaces
N/A		Recommendation 2: Tata should be asked to review this event in the context of previous bleeder releases to see if there are any common causes that can be remedied to reduce the risk of future bleeder openings.	N/A

Section 5 - Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- advise on corrective actions verbally or in writing
- require you to take specific actions in writing
- issue a notice
- require you to review your procedures or management system
- change some of the conditions of your permit
- decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you.

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and or suspension or revocation of the permit.

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- ensure you comply with other legislative provisions which may apply.

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance which could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General Information

Data protection notice

The information on this form will be processed by Natural Resources Wales (NRW) to fulfill its regulatory and monitoring functions and to maintain the relevant public register(s). NRW may also use and/or disclose it in connection with:

- offering/providing you with its literature/services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, local authorities) on environmental issues
- carrying out statistical analysis, research and development on environmental issues
- providing public register information to enquirers
- investigating possible breaches of environmental law and taking any resulting action
- preventing breaches of environmental law
- assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Information Regulations request.

NRW may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

NRW will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within twenty working days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with the officer's line managers. If you wish to raise your dispute further through our official **Complaints** and **Commendations** procedure, phone our general enquiry number **0300 065 3000** (Mon to Fri **08.00–18.00**) and ask for the **Customer Contact team** or send an email to enquiries@naturalresourceswales.gov.uk. If you are still dissatisfied you can make a complaint to the Public Services Ombudsman for Wales. For advice on how to complain to the Ombudsman phone their helpline on **(0845) 601 0987**.