Complete - Notes Link

TATA STEEL

TATA

Tata Steel Strip Products UK
Port Talbot Steelworks
Coke Ovens

Response to Improvement Condition (IC3):

The Operator shall propose a methodology for assessing visible emissions from the coke oven batteries. The methodology shall be equivalent to with the methods identified in BATc44 and 46

			Signed	Dated
Written:	Charlotte Barlow	Environmental Process Specialist Coke Ovens		25/08/15
Checked:	Jason Heatman	Lead Environmental Engineer		26/08/15
Approved:	Richard Leonard	Environment Manager		27/08/15

INTRODUCTION

Tata Steel and the NRW have been discussing the proposed methodology since June 2015 and have mad various visits to site. (CAR report number 5915).

In order to satisfy the improvement condition, the procedures for the methodology for assessing visible emissions from the coke oven batteries is detailed in this report.

It is Tata Steel's opinion that the methodology meets with BATc 44 and 46

TATA STEEL STRIP PRODUCTS UK

TECHNICAL LABORATORIES

RAW MATERIALS TRAINING MANUAL

MODULE 2

ENVIRONMENTAL VISUAL SURVEY MONITORING AT MORFA COKE OVENS

Author: Jason Francis – Lead Technician Raw materials
Reviewed by: Charlotte Barlow – Plant Area Specialist for the Environment, Morfa Coke Ovens (2015)

Table of Document Contents
Reference Description Page

2:1:1 Aims

This module introduces personnel to the methods of visible emission monitoring at Morfa coke ovens.
The visible emission monitoring includes emission surveys of coke oven doors and leveller doors during Carbonization as well as the reporting of charging emissions.
The purpose of this document is to update the earlier visual assessment methods developed by the BCRA so that the result is expressed in terms compatible with the BAT-associated standards listed in the 2012 Iron and Steel BREF note (specifically, BAT44 and BAT46). Good practices from other methods mentioned in the BREF note, such as the US-EPA Method 303 and the method used in the Netherlands have also been incorporated.
Visible emissions must be monitored in order for MCO to conform to strict environmental legal requirements.

Key Hazards - Gaseous environment and moving machinery therefore all appropriate PPE must be worn at all times and all new starters must be supervised at all times by experienced and competent personnel until all training has been successfully completed.

2:1:2 Objectives

On completion of Module 2, trainees should be competent in the following objectives

- Ensure clear knowledge of associated SOP, COSHH etc.
- Have a clear understanding of the importance of safety awareness and correct usage of PPE
- Safe Access/Egress to task area.
- Carry out visual monitoring surveys safely and to a high standard.

2:1:3 Associated Document Links

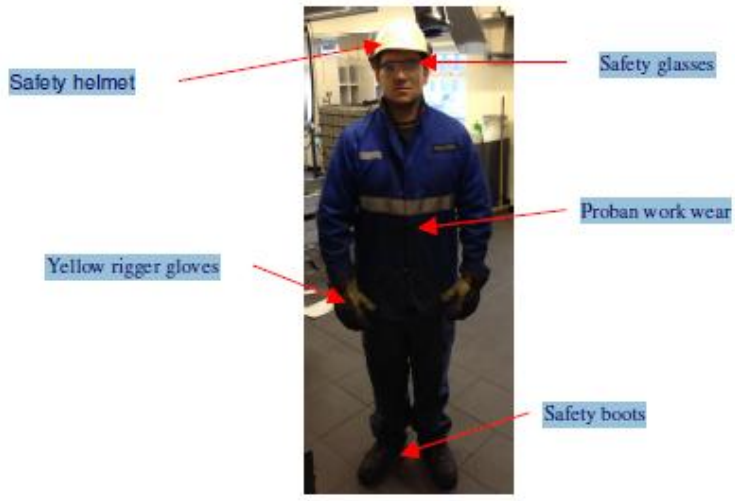
Determination of Pollution Control……DISC-6CC8NR

2:1:4 Frequencies

- Surveys of smoke leakage during carbonisation are to be carried out once a day (including weekends).
- 3 x ovens must be assessed for charging emissions each day (including weekends)
- Ideally each oven must be assessed for charging emissions each quarter (with the understanding that the pushing schedule may not always allow for this)
- Additional tests can be carried out on a customer request basis.

2:1:5 Preparations for survey

Ensure all PPE required is being worn before proceeding to Morfa coke ovens to carry out the task.

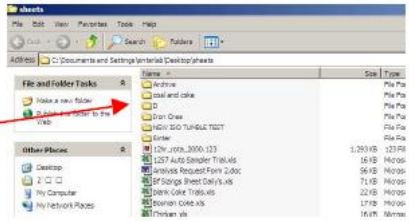


When accessing the Battery Bench level or Top, a **Sundstrom Powered Respirator** must also be worn (available from Morfa PPE room)

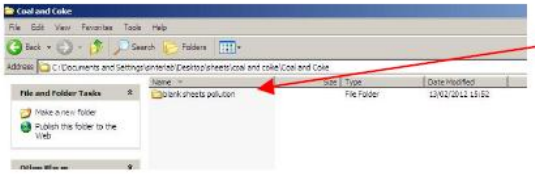
Have a stopwatch ready to hand.

- Print out appropriate pollution survey sheets including charging survey sheets and attach to clipboard. Print out sheets using the following flowchart:

❑ Select the sheets folder found on the desktop



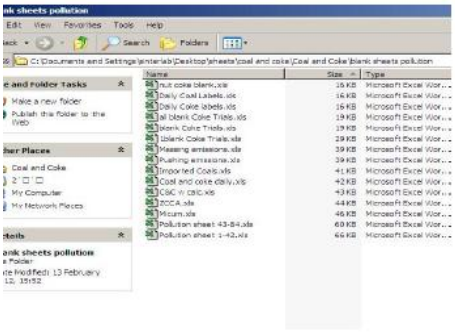
❑ Within the sheets folder select the Coal and cokes folder



Within coal and cokes folder select blank sheets to pollution

Required sheets:

'Pollution Sheet Ovens 1-42'
'Pollution Sheet Ovens 43-84'
'Charging Emissions Sheet'



2:1:6 Access and Egress

On arrival, the labs truck should be parked safely either behind Morfa admin block in the designated car park or adjacent in the one of the other two main car parks.

In the event of a fire or emergency the nearest assembly point is in the Morfa Main Canteen (Admin Block)

A copy of the local emergency plan can be found in Morfa shift managers' office. A copy may also be located in the team leaders office.

Proceed to control room located on the first floor of Morfa battery to sign in using the following route:

- Ensure that the ram is stationary or working at a safe distance from the lift or stairway areas
- Ram has an audible siren as well as flashing beacons to alert of any movement.
- Proceed across ram track through gate:

- Walk up two flights of stairs to first floor level

- Walk to end of walkway to control room.

The signing in book can be found just inside the door. All lab personnel must record their name, number of personnel accompanying them, department i.e. Labs, area visiting i.e. battery along with the date and time arrived.
Make yourself known to one of the operators in the control room and let him know your intentions and where your whereabouts will be. Ask if there are any Safety issues that you need to be aware off in the area you intend to visit so you are sure in advance the area will be safe.
The Battery is to be surveyed in conditions as close as possible to normal operations. Ask if this is the case when you sign in. If it is not the case (e.g. Battery is on a prolonged stop), return to carry out the survey at a later time.
Ask about the pushing schedule. This will determine ovens to temporarily excluded (see page 11).

2:2:1 Surveys of smoke leakage during carbonization

- Retrace route back down stairs, across ram track and proceed over to Morfa admin block.
- Proceed over to PPE safety store located on ground floor.
- State name and SAP number to safety store personnel who will then provide you with an airstream helmet and battery belt equipped with filtration unit.
- Fasten belt containing battery pack and filtration unit around waste ensuring belt is secure.
- Connect hose of helmet to connection point located on top of belt.
- Place helmet on head and press start button again located on top of belt pack to test that clean air passes in and around helmet.

    - Press button once to receive a low level of clean cool air.
    - Press button twice to receive a high level of clean cool air.
    - Hold button to turn off filtration unit and airflow will stop through helmet.

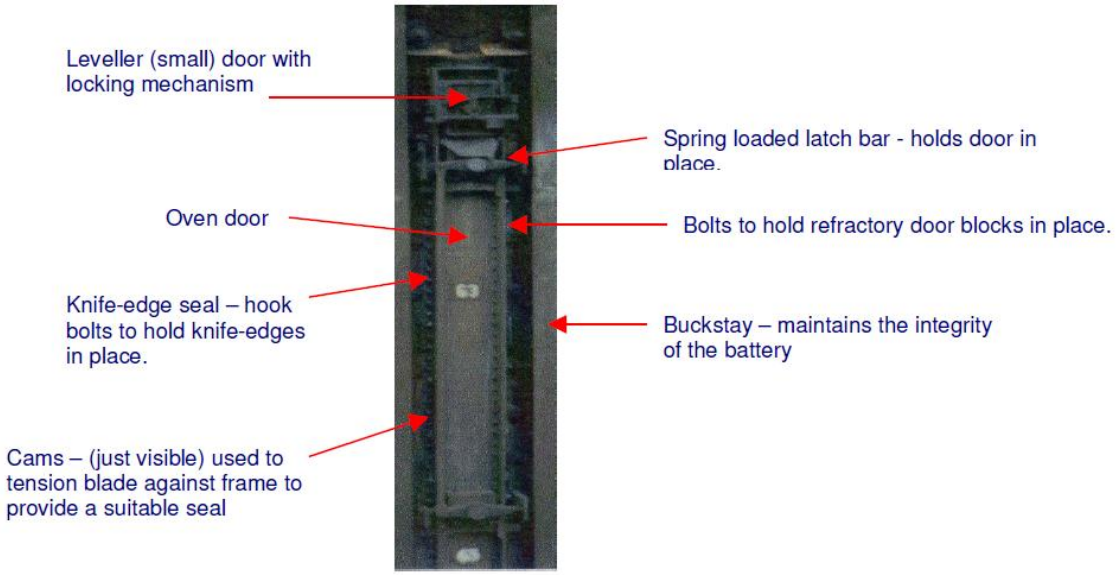
An airstream filtration unit is required to be worn at all times when on top of the battery. Its purpose is to filter out any Poly aromatic hydrocarbons, which are hazardous to health. The system also provides cool clean air as
the coke ovens are hot working conditions as well as hazardous. The silver Keppe on the back of the helmet helps to reflect heat reducing the amount of heat the operator is exposed too.
The use of an airstream helmet is to be used at all times regardless of how long you are on top of the battery.

Walk back to the battery and walk onto the designated walkway facing the north side of the battery. Again, ensure a safe distance from the ram is maintained.

Use designated walkway when conducting survey during coke carbonisation.

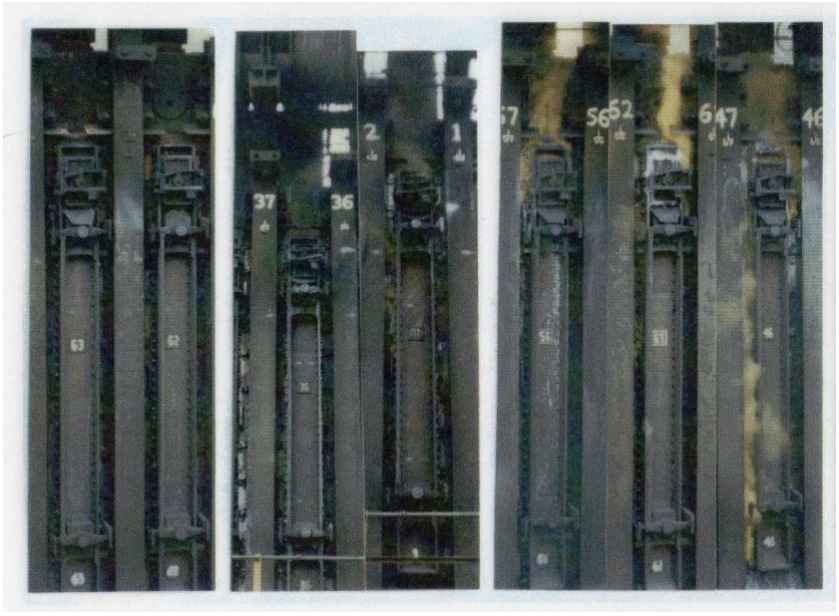
- Walk to the far end of the ovens on the ram side to oven number 1.
- All ovens are numbered and can be seen on the top right of the oven.
- The number corresponds to the oven adjacent to the left.
- Oven numbers go from 1-84.
- Walk at a steady pace along the Battery, observing leaks as you pass.

2:2:2 Coke Oven Door Layout (Ram side view)

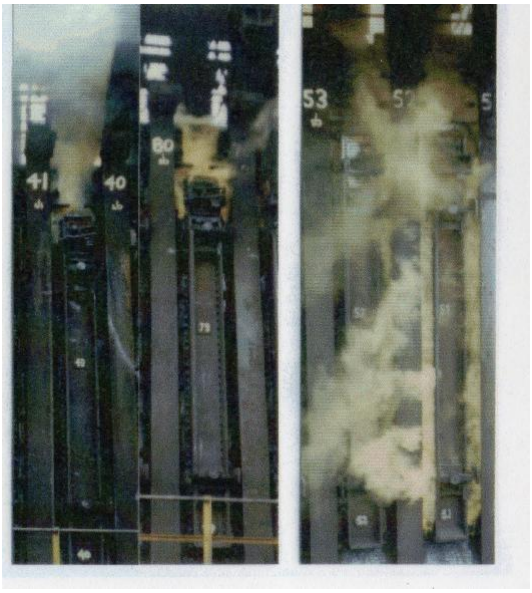


Working from right to left (ovens 1-42) score the smoke leakage from each oven, each oven is either a ‘leak’ (1) or ‘no leak’ (0). Do not re-score any ovens if you pass them a second time. It is a ‘single spot check’ only.

2:2:3 - Smoke Leakage During Carbonisation – Grades of Leakage from Coke Oven Doors

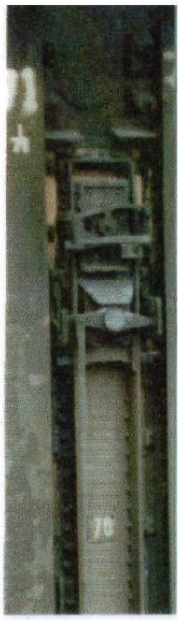


0 (‘no-leak’) 1 (‘leak’) 1 (‘leak’)

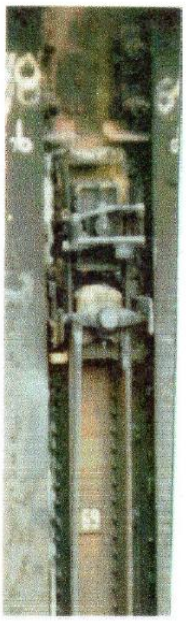


1 (‘leak’) 1 (‘leak’)

2:2:4 - Smoke Leakage During Carbonisation – Grades of Leakage from Leveller Doors



0 (‘no-leak’)

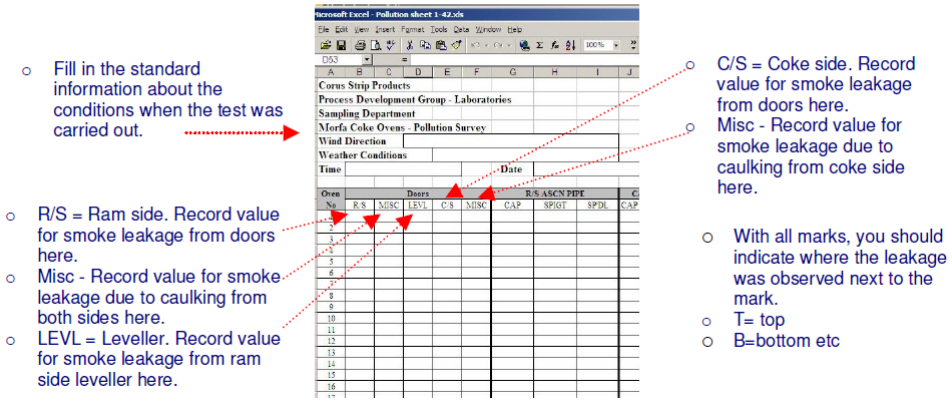


1 (‘leak’)

1 (‘leak’)

1 (‘leak’)

When scoring the doors and levellers, write a ‘1’ for each oven that has gas leaking in the corresponding box on the data entry sheet.
If the door is clearly on fire, then record an ‘F’ in the box.
The fires do not form part of the percentage calculation, but are reported separately.
e.g. ‘92% of tops and 85% of doors were not leaking. 2 doors were on fire.’



When the door survey on all the ram side and leveller doors is complete walk to the south end of the battery and cross over to the coke side via the tunnel next to the south quench tower.
Repeat the same process of surveying smoke leakage from all oven doors (no levellers are present on coke side).

To survey ovens 1-42 take a position inside the wharf man’s inspection area and walk along the platform until all the ovens have been classified.

Note: visibility may be affected due to steam from the quenched coke rising from the coke wharf.

In this situation, wait for the steam to clear before continuing the survey or return later when the steam would have dissipated.

To survey ovens 42-84 walk along the roadway approximately the same distance away from the ovens as the wharf man’s inspection area.
Note – take care on uneven ground due to coke spillages and uneven surfaces.

If the ‘Dump Wharf’ is operational (there are heavy plant and trucks moving hot coke in Battery 2 Coke side area), be aware of heavy plant movements at all times and keep a clear distance.
If you feel it is unsafe to access all ovens return to them at a later time. If this is not practicable, make a note of those not surveyed and subtract them from the total.

Be sure to return to any unclassified ovens that were previously obscured by any machinery.

For safety reasons, door sealers are unable to access within 15 safety plates of Battery machinery (Rams and Guides).
For this reason, **the last 3 ovens to be pushed should be discounted from surveys:**

Find out the oven pushing sequence from the Control Room.
This will either be ovens **0s and 5s, 1s and 6s, 2s and 7s, 3s and 8s** or **4s and 9s.**

In the above example, the sequence was **4s and 9s,** so within the 15 safety plates (red arrow), ovens 14, 19 and 24 can be discounted from the survey, as they were the last to be pushed.

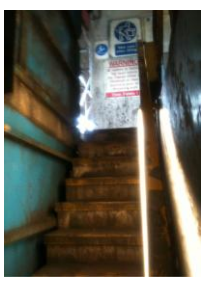
Ensure to make a note of these ovens (as well as those obscured by the machine) and return to them at the end of the survey.

Other exceptions from the survey: any ovens with the door removed or any ovens undergoing maintenance. Any ovens that cannot be viewed safely can also be excluded and returned to at a later time (if safe). Record the oven number and make appropriate notation in the 'comments' section. These will need to be subtracted from the final calculations.

When all ovens have been classified retrace route back to ram side via the South underpass to the battery bunker in preparation to go on top of the battery to complete the rest
of the survey.

Note **nets need to be worn.**

Follow the stairs to the second floor (battery top)

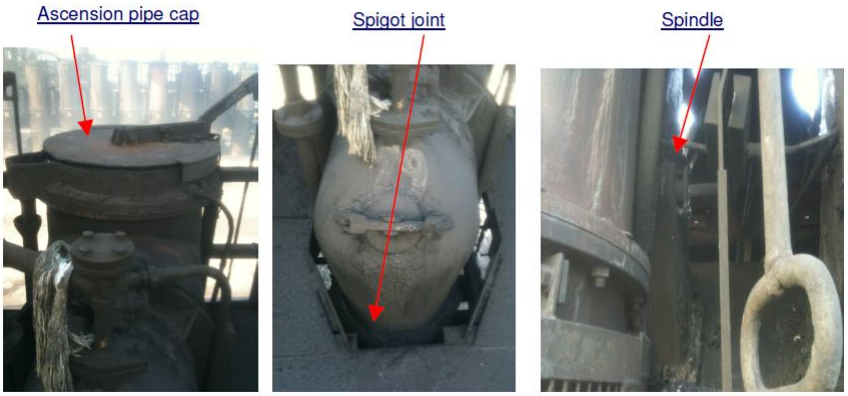


Make contact with production personnel in the coal charging machine so they aware you are in the area carrying out a survey

Ensure when walking on the battery top that you use the walkway marked with floor studs. Using this walkway ensures a safe passage to each side of the ovens avoiding any contact with the charge car. Be aware of the charge car moving. An audible alarm can be heard when the coal charger car moves.

The battery top has a number of fixed gas monitors present. If an alarm is heard and the beacons at the end of the battery flash proceed off the battery back down to ground level via the stairs.

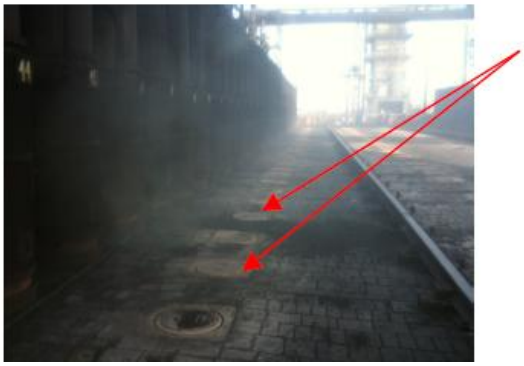
Using either the battery top walkway or by going up the stairs to the collecting main walkway assess the spigot joint, ascension pipe cap and spindle for each oven. Note, this is now close to the process so take extra care and only pause where safe.



Survey being carried out from collector main walkway.
Do not attempt to pass an ascension pipe cap that is gassing or flaming across the walkway.
Return to the stairway and access the remaining ovens from the other end of the walkway. If an ascension pipe cannot be viewed safely (e.g. floor plates up), ensure to make a note of these and subtract them from the final score.

As the battery has two collector mains, this procedure must be carried out on both the ram side and coke side of the battery.

Whilst on the battery top assess each oven's charge lid. These are labeled '1 to 4' from East to West.



- Oven charge lids.
- There are x4 lids for each oven.
- Walk along the battery in away to pass each individual charge hole lid and assess.
- Do not stand on charge hole lids or inspection lids due to extreme heat radiated from them.
- Be alert of any movement of the charger along the battery top

There is again a 'Leak / no leak' scale to assess the ascension pipe cap, spigot joint, spindle and coal charge cap. A '1' or a '0' is given for each emission point and written in the corresponding box on the pollution survey sheet.

Again, return to any ovens that were previously obscured by machinery to finish your assessments.

- Survey now complete. Retrace steps back down to first floor of battery to control room, sign out.
- Proceed down steps to ground floor and return to labs van.
- Return to labs via same route used to get to Morfa coke ovens.
- Note – some morfa shift managers may request a paper copy of the results. These should be left in Morfa coke oven shift managers office located on ground floor Morfa admin block.

2:3:1 Carrying Out Charging Emission Surveys

- Use the same access route, PPE, process of signing in at the control room as described in section 2:2:2.
- Check with the production operator what is the pushing schedule is and check that the oven being pushed has not been assessed for that quarter.
- Ideally, all 84 ovens must be assessed each quarter, with an understanding that the pushing schedule may not always allow for this.
- A total of 3 ovens must be assessed each day (including weekends)

Proceed from control room to battery top via stairs and enter onto the battery top.

Note at this level air stream helmets need to be worn. To acquire air stream helmet and procedure of how to operate air stream equipment refer to section 2:2:2

Ensure when walking on the battery top that you use the walkway marked with floor studs.

Using this walkway ensures a safe passage to each side of the ovens avoiding any contact with the charge car.
Be aware of the coal charge car moving. An audible alarm can be heard when the coal car moves.
Make contact with the charge car operator so they aware you are in the area carrying out a survey.

Take an observation point 12-15 metres from the charging car with smoke bellowing towards you. Ensure you can observe the entire charging system.

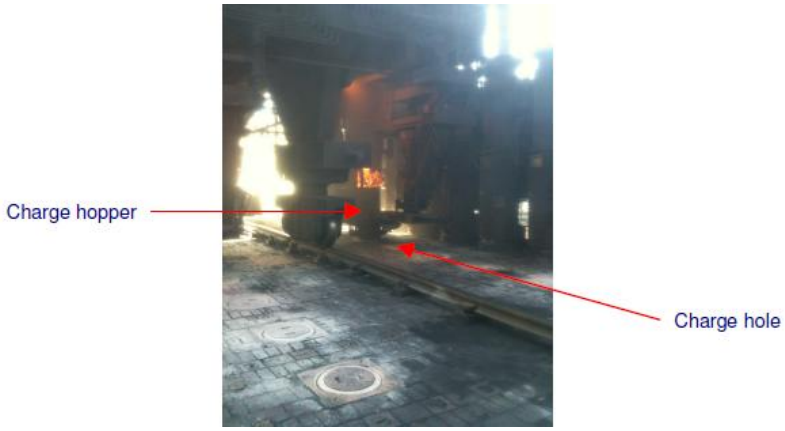
Record all information at the top of the charging emissions sheet, including the number of the oven being charged, the approximate time of the charge and the charge car in operation (screwfeed or bellflow – if you are unsure, ask the charge car driver or valve man).

Consider all emissions that occur from start of charge (point at which coal leaves charging car and enters oven)
to end of charge (sealing of the last charge hole lid).

Charge lid being removed before telescopes are inserted in hole. Coal begins to flow into oven (stopwatch start point).

Charge lid returning back in place
after telescope is retracted means coal car
has completed filling oven with coal (point at which to stop stopwatch)

When coal charge begins to enter the oven, using an accumulative-type stopwatch, record the total time emissions are observed. During the charging period, observe all potential sources of emission from the entire charging system. Upon observing any source of emission, start the stopwatch. Pause the watch when emissions are no longer visible and re start if and when emissions re-emerge.



When emissions occur simultaneously from more than one point, consider the sources as one.
Time single 'puffs' of emission only for the time it takes for the puff to emerge.
If fugitive emission from other sources (e.g. steam leaks) prevents a clear view of the charging system, pause the stopwatch until the view is clear and make an appropriate comment in the 'comments' section.
Record the accumulated emissions time to the nearest 0.5 seconds under 'Visible Emissions (s)' on the charging emissions sheet:

Charging Emissions sheet

Battery No.	
Date:	
Observer name:	
Shift:	

Oven No.	Clock Time	Visible emissions (s)	Comments

- Survey now complete. Retrace steps back down to first floor of battery to control room, sign out.
- Proceed down steps to ground floor and return to labs van.
- Return to labs via same route used to get to Morfa coke ovens.
- Leave a paper copy of results in the Morfa coke oven shift managers office, located on ground floor Morfa admin block

2:4:1 Submitting results

Results are submitted via an excel spreadsheet.
Type the name of the sampler, the date and the time commenced / completed in the box at the top of the sheet:

Pollution Survey Scores		
Date:		
Completed by:		
Time commenced:		
Time completed:		
Oven No.		Battery Top

Record the number of doors / ascension pipes / lids missed due to maintenance or safety reasons. Record these in the boxes at the bottom of the sheet:

	Batt 1		Batt 2
No. Asc. Pipes Missed	0		34
	420		318

No. Doors Missed			Doors
Batt 1 R/S	1		41
Batt 1 C/S	0		42
Batt 2 R/S	0		42
Batt 2 C/S	0		42

Lids Missed			
Batt 1	0		168
Batt 2	0		168

The calculations will then automatically exclude these from the survey results.
Type a ‘1’ in the corresponding box of any item that was observed as leaking or an ‘f’ for any door that was seen to be on fire:

Battery 2

Oven Number:	Doors			Battery Top									
	RS	Lev	CS	Cap		Spigots		Spindles		Lids			
				R/S	C/S	R/S	C/S	R/S	C/S	1	2	3	4
43													
44		1											
45						1	1						
46						1							
47		1											
48						1							
49		1					1						
50	1	1				1							
51													
52													
53		1											
54						1							
55		1	1									1	
56													
57													
58		1											
59													
60		F				1						1	
61													

The results are then shown at the bottom of the sheet in bold:

Leak / No Leak			
Batt 1			
Doors	21	17.07	**82.93**
Tops	20	4.76	**95.24**
Batt 2			
Doors	17	13.71	**86.29**
Tops	21	5.00	**95.00**
No. Fires Batt 1	0		
No Fires Batt 2	1		

These are the final percentage scores

Scores are reported as a basic percentage of ovens / tops leaking divided against those assessed. E.g.:

Doors Battery 1 = (No. doors leaking / No. doors assessed) x 100

This is reported as a monthly mean.
Door fires are reported separately as a monthly mean.
The spreadsheet is then emailed with the charging emissions sheet to all relevant personnel at MCO.