Appendix E – E Mail Trail between Tata and Local NRW officers discussing Lean/Rich Gas proposed weighted average calculations.

From: Cowie, Douglas <Douglas.Cowie@cyfoethnaturiolcymru.gov.uk>
Sent: Thursday, August 13, 2020 12:36 PM
To: Llewelyn, Angharad <Angharad.Llewelyn@tatasteeleurope.com>
Cc: Grainger, Claire <claire.grainger@tatasteeleurope.com>; Herbert, Neil <Neil.Herbert@cyfoethnaturiolcymru.gov.uk>
Subject: NOx underfiring query (A55 Morfa Main Stack)

External email

Hi Angharad

I've been looking at the question you raised regarding the application of lean (BFG) and rich (COG) emission limit values for NOx at A55. I have a few queries about the configuration of the underfiring waste gas system:

1. Please can you confirm if the following information obtained from the original IPPC permit application is still accurate:
   - The MCO underfiring waste gases are conducted to the main stack by two waste gas flues (3.5m2 cross section) positioned along the ram side of both batteries
   - This configuration means there are separate 'north' and 'south' waste gas ducts along the ram side. These meet at the mid-point of the coke ovens and then connect to the main stack.

2. What I couldn't work out from the IPPC application documents is if the north and south waste gas flues *continue* across from MCO to the main stack, or if they combine into a common duct at the point where they meet on the ram side. Is there a diagram/plan/schematic available which shows the underfiring waste gas system layout?

3. Finally it would be helpful to know where A55's NOx monitoring point is located. Is this situated on a common section of duct, or can samples be obtained from both the north and south underfiring waste gas ducts?

I had not appreciated that a 'dual' lean/rich underfiring regime for MCO was possible – I had always thought it was one or the other. We can update the permit if necessary in

due course, but in the short-term I will get you some clarity regarding the application of these limits. Thanks for raising this with us.

Kind regards

Doug

Doug Cowie
Uwch Swyddog – Rheoleiddio Diwydiant a Gwastraff / Senior Officer – Industry and Waste Regulation
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Siaradwr Cymraeg – Welsh Speaker

Gallwch hefyd cysylltu â ni gan ddefnyddio cyfeiriad e-bost y Tîm Rheoli Diwydiant.
You can also contact us using our Industry Regulation Team email address.
industryregulation.swwales@cyfoethnaturiolcymru.gov.uk

From: Llewelyn, Angharad <Angharad.Llewelyn@tatasteeleurope.com>
Sent: Monday, August 24, 2020 3:02 PM
To: Cowie, Douglas <Douglas.Cowie@cyfoethnaturiolcymru.gov.uk>
Cc: Grainger, Claire <claire.grainger@tatasteeleurope.com>; Herbert, Neil <Neil.Herbert@cyfoethnaturiolcymru.gov.uk>; Ace, Nathan <nathan.ace@tatasteeleurope.com>; Jenkins, Beverley <beverley.z.jenkins@tatasteeleurope.com>; Massey, Jason <Jason.Massey@tatasteeleurope.com>; Townsend, Andrew <andrew.townsend@tatasteeleurope.com>
Subject: RE: NOx underfiring query (A55 Morfa Main Stack)

Good afternoon Doug,

Please see the responses to your queries below:

1. Please can you confirm if the following information obtained from the original IPPC permit application is still accurate:
   - The MCO underfiring waste gases are conducted to the main stack by two waste gas flues (3.5m2 cross section) positioned along the ram side of both batteries –
   - This configuration means there are separate ‘north’ and ‘south’ waste gas ducts along the ram side. These meet at the mid-point of the coke ovens and then connect to the main stack.

   Both of the above bullet points are still accurate.

2. What I couldn’t work out from the IPPC application documents is if the north and south waste gas flues *continue* across from MCO to the main stack, or if they combine into a common duct at the point where they meet on the ram side.

Is there a diagram/plan/schematic available which shows the underfiring waste gas system layout?
Please see schematics attached. The flues continue across the MCO to the main stack, they don't combine into a common duct.

3. Finally it would be helpful to know where A55's NOx monitoring point is located. Is this situated on a common section of duct, or can samples be obtained from both the north and south underfiring waste gas ducts?
There is no monitoring point as such, just the sampling points. The samples are obtained separately from the North and South ducts respectively.

Finally, if acceptable, we would like to propose that moving forward we report both the North and South duct sampling results separately to avoid any confusion as to which limit to apply (1600 / 4000). We could submit this request as part of our permit variation.

If you have any further questions or comments regarding the above, please do not hesitate to ask.

We look forward to your response.

Met vriendelijke groet / Kind regards,

Angharad

Angharad Llewelyn
Environmental Engineer

From: Launder, Michael <Michael.Launder@tatasteeleurope.com>
Sent: 22 September 2020 13:49
To: Herbert, Neil <Neil.Herbert@cyfoethnaturiolcymru.gov.uk>; Cowie, Douglas <Douglas.Cowie@cyfoethnaturiolcymru.gov.uk>
Cc: Ace, Nathan <nathan.ace@tatasteeleurope.com>; Jenkins, Beverley <beverley.z.jenkins@tatasteeleurope.com>
Subject: Morfa Main - NOx Emission Limit Calculation - Lean and Rich Firing

Neil, Doug,

In advance of the call later, we've prepared this for discussion. It calculates a weighted average NOx limit for Morfa Main based on gas mix for underfiring.

I've included examples back to 2017.

	Battery 1	Battery 2	Total
BF (volume)	40.42	0	40.42
COG (volume)	1.32	11.93	13.25
Total	41.74	11.93	53.67
BF%	97%	0%	75%
COG%	3%	100%	25%

Lean limit	1600	Limit x %age of fuel mix	1205.0
Rich limit	4000		987.5
		Weighted Average Limit	2192.5
		Spot Sample Result (mg/m/3)	1602.1

NOx Limit Template | HY1 2020# | HY1 2019 | HY1 2018 | HY2 2018 | HY2 2017# | HY1 2017

	Battery 1	Battery 2	Total
BF (volume)	36.29	41.01	77.3
COG (volume)	2.7	0	2.7
Total	38.99	41.01	80
BF%	93%	100%	97%
COG%	7%	0%	3%

Lean limit	1600	Limit x %age of fuel mix	1546.0
Rich limit	4000		135.0
		Weighted Average Limit	1681.0
		Spot Sample Result (mg/m/3)	1053.1

NOx Limit Template | HY1 2020# | HY1 2019 | HY1 2018 | HY2 2018 | HY2 2017# | HY1 2017

	Battery 1	Battery 2	Total
BF (volume)	52.88	44.13	97.01
COG (volume)	0	0.05	0.05
Total	52.88	44.18	97.06
BF%	100%	100%	100%
COG%	0%	0%	0%

Lean limit	1600	Limit x %age of fuel mix	1599.2
Rich limit	4000		2.1
		Weighted Average Limit	1601.2
		Spot Sample Result (mg/m/3)	1138

NOx Limit Template | HY1 2020# | HY1 2019 | **HY1 2018** | HY2 2018 | HY2 2017# | HY1 2017

	Battery 1	Battery 2	Total
BF (volume)	37.77	30.86	68.63
COG (volume)	3.87	4.03	7.9
Total	41.64	34.89	76.53
BF%	91%	88%	90%
COG%	9%	12%	10%

Lean limit	1600	Limit x %age of fuel mix	1434.8
Rich limit	4000		412.9
		ghted Average Limit	1847.7
		Spot Sample Result (mg/m/3)	1203.4

NOx Limit Template | HY1 2020# | HY1 2019 | HY1 2018 | **HY2 2018** | HY2 2017# | HY1 2017

	Battery 1	Battery 2	Total
BF (volume)	0	40.35	40.35
COG (volume)	12.46	1.73	14.19
Total	12.46	42.08	54.54
BF%	0%	96%	74%
COG%	100%	4%	26%

Lean limit	1600	Limit x %age of fuel mix	1183.7
Rich limit	4000		1040.7
		Weighted Average Limit	2224.4
		Spot Sample Result (mg/m/3)	2103.7

HY1 2020# | HY1 2019 | HY1 2018 | HY2 2018 | **HY2 2017#** | HY1 2017

	Battery 1	Battery 2	Total
BF (volume)	25	49	74
COG (volume)	4	1	5
Total	29	50	79
BF%	86%	98%	94%
COG%	14%	2%	6%

Lean limit	1600	Limit x %age of fuel mix	1498.7
Rich limit	4000		253.2
		Weighted Average Limit	1751.9
		Spot Sample Result (mg/m/3)	1349.8

HY1 2020# | HY1 2019 | HY1 2018 | HY2 2018 | HY2 2017# | HY1 2017

Two instances where the spot sample results was > lean limit:

- HY1 2020
- HY2 2017

In both cases, the result was below the weighted average as there was a proportion of COG being used as part of the mix, so if applying this weighted average method we didn't breach.

Happy to discuss this further on the call.

Thanks,

Mike

Michael Launder
Environmental Engineer

Tata Steel
T: +44 (0)1639 606579

From: Cowie, Douglas <Douglas.Cowie@cyfoethnaturiolcymru.gov.uk>
Sent: Tuesday, September 22, 2020 4:26 PM

To: Launder, Michael <Michael.Launder@tatasteeleurope.com>; Herbert, Neil <Neil.Herbert@cyfoethnaturiolcymru.gov.uk>
Cc: Ace, Nathan <nathan.ace@tatasteeleurope.com>; Jenkins, Beverley <beverley.z.jenkins@tatasteeleurope.com>
Subject: RE: Morfa Main - NOx Emission Limit Calculation - Lean and Rich Firing

External email

Hi Mike

Thanks for the information and for the earlier discussion on this topic.

On reflection we think this is something which should be included in the permit variation application which is pending. The existing 'lean' and 'rich' NOx emission limits at A55 do not appear to have changed since the original 2004 permit was issued. It is recognised that operating regimes may evolve over time and the same is true of permits. Our permitting process would be the appropriate way of considering any amendments to these limits.

If this approach presents any difficulty or may delay your impending variation application, please let us know.

Thanks

Doug

Doug Cowie
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