Natural Resources Wales permitting decisions

Variation

We have decided to issue the variation for Port Talbot Steelworks operated by TATA Steel UK Limited.

The variation number is EPR/BL7108IM/V015.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Structure of this document

- Key issues
- Annex 1 the decision checklist
- Annex 2 the consultation and web publicising responses

Key issues of the decision

Contents

1. Background

This variation updates the permit to incorporate changes made as a result of the planned upgrade to the internal power generation facility (the new power station) at the Port Talbot Steelworks site.

The new power station will comprise the installation of two new boilers (nominally up to 164 MWth each) and associated steam turbine sets with a total gross electrical power generation output of up to 150 MWe. The new boilers will replace four of the site's existing boilers (Service Boilers 4 and 5, Boiler 5 (Margam A) and Mitchell Boiler (Margam B)), which will be decommissioned once the new plant is commissioned and operating in a reliable and continuous manner. Three of the existing turbo alternators (Turbo Alternators B1, 2 and 3), and up to three stacks associated with the disused boilers will also be decommissioned. The decommissioned plant will not be removed from the site. Post commissioning, use of the decommissioned plant will be prevented by conditions included in the permit as part of this variation.

The new power station will be predominantly fuelled by gases which are generated by the steel making process (i.e. blast furnace gas (BFG), basic oxygen steelmaking gas (BOSG) and coke oven gas (COG)). The facility will also have the ability to be fuelled on imported natural gas, which will be used as a standby fuel for flame stabilisation when site-generated gases are found to be of low calorific value, and to maintain minimum load on the boilers if and when process gases are not available. Therefore although the boilers will have the ability to be fired on natural gas, this fuel will only be used on infrequent occasions, and, during normal operation the facility will not require the import of natural gas.

By utilising the majority of the process gases that are currently flared (and thereby reducing the site's reliance on imported natural gas), the upgrade will increase the overall electricity generation capacity of the steelworks despite a net decrease in the volume of gases combusted at the site.

The new boilers and turbine sets will be housed in new buildings adjacent to the existing power generation plant and will be connected to the existing BFG distribution network in order to receive fuel gases. The changes will result in a total onsite power generation capacity at the Port Talbot Steelworks site of up to a maximum of 245MWe (nameplate capacity).

In addition to the new boilers and associated steam turbines sets, the following major and ancillary components will be included in the planned upgrade:

- A new electrical connection, which will connect the new power generation facility with existing substations situated at the south eastern end of the steelworks site;
- Two 80m stacks which will be connected to the new boilers;
- An annexe bay and boiler house;
- A turbine building to house the steam turbo-alternator sets and their condensers;

- Cooling tower units comprising cooling towers, electrical control room and cooling water pump house;
- Electrical switchgear station building;
- Condensate storage tank and additional condensate polishing units;
- Feed water treatment plant and chemical dosing system skids;
- Administration, workshop, pump house, gas booster house, control buildings and ancillary infrastructure;
- Extension of existing pipework connections for services and utilities;
- Connection to site drainage systems;
- Security infrastructure; and
- Connections to the existing internal road layout.

It is anticipated that the construction and commissioning phase of the project will take three years from the commencement of site preparation works to the attainment of a stable operating state for the two new boilers. The commissioning phase for the new boilers will take six months; during this period the existing power station will continue to operate in its current state, but only one new boiler will be in operation at any point in time. Once the new boilers are both able to operate in a stable manner the redundant existing boilers and associated plant will be decommissioned.

The application included a request to extend the time-limited derogation for compliance with BAT conclusion 26 (as contained within the BAT conclusions for the Manufacture of Iron and Steel published on 8th March 2012) from October 2016 to August 2017. However, during the determination period, the operator informed NRW that it wished to withdraw this aspect of the application. The request is therefore not considered further here and the original derogation timeline still stands.

2. Applicable directives

Chapter III of the Industrial Emissions Directive

All Environmental permits which permit the operation of large combustion plant (LCP), as defined by articles 28 and 29 of the Industrial Emissions Directive (IED), need to be varied to implement the special provisions for LCP given in the IED, by 1st January 2016 (Article 82(3)). The IED makes special provisions for LCP under Chapter III, introducing new emission limit values (ELVs) applicable to LCP, referred to in Article 30(2) and set out in Annex V.

The seven existing boilers at the Port Talbot site meet the definition of LCP given in the IED. The new boilers that will be installed as part of the new power station (Boilers 8 and 9) also meet the definition of LCP. These new LCPs have been added to the UK LCP inventory and have been assigned LCP reference numbers; these numbers are included in the permit through this variation.

For existing LCP, the IED provides a period of transition towards the new ELVs via Article 32, the Transitional National Plan (TNP). Six of the seven existing

boilers at the Port Talbot steelworks site are included in the UK's TNP, as follows:

- Service boilers 4 and 5 (LCP 337);
- Boiler 5 (LCP 339);
- Boilers 6 and 7(LCP 340); and
- Mitchell boiler (LCP 338).

The emission points associated with these boilers are A50, A51, A52A, A52B and A53 respectively. The previous variation of the permit (ref. EPR/BL7108IM/V014) included an improvement condition (ref. IC 5) requiring the operator to define emission limit values (ELV) for emission points A51 and A53 for the period 1st January 2016 to 30th June 2020 by August 2015. A report outlining the ELVs for emission points A51 and A53 that should apply during the transitional period has been submitted to NRW by the operator. NRW has accepted the proposed ELVs for these emission points and they have been incorporated into the permit as part of this variation.

The seventh existing boiler, Boiler 3 (LCP 73; emission point A62), is excluded from the TNP because it did not have an environmental permit before 27th November 2002 (as outlined in Article 32(1) of the IED). ELVs for emission point A62 have been set for the period between 1st January 2016 and 30th June 2020 based on Part 1 of Annex V of the IED. Although outside the TNP, Boiler 3 falls within the definition of 'existing' large combustion plant as described in article 30(2) of the IED. We have therefore specified emission limits for Boiler 3 which are in line with Part 1 of Annex V of the IED.

As the intention is to fire the existing boilers on a blend of process gases then the provisions of article 40(1) apply. For sulphur dioxide, oxides of nitrogen and particulate we have specified emission limits that encompass the range of limits outlined in Part 1 of Annex V for gas-fired combustion plant that is not a gas turbine or a gas engine, and have included a set of footnotes requiring the operator to calculate the emission limits for blended fuels based on the description given in article 40(1).

A further improvement condition (ref. IC 6) was included in the previous variation which required the operator to define and submit ELVs for emission points A51, A53 and A62 post 30th June 2020. The operator was required to submit its response to this improvement condition in December 2015; the submission has been received however at the time of issue NRW was still considering its content.

3. Biodiversity, landscape and heritage

The operator has undertaken an assessment of the potential impact on all four sites using the criteria set out in the H1 Environmental Risk Assessment screening guidance.

The operator used ADMS 5 modelling software to predict ground level concentrations and deposition rates of pollutants emitted from the seven original boilers and two new boilers for the existing and proposed operational gas configurations. For the existing boilers, the current emission points have been used in the modelling. For the two new boilers, the proposed emission points have been used. PCs have been generated at each of the sensitive receptors for the following parameters:

- Oxides of Nitrogen (NO_x);
- Sulphur Dioxide (SO_2);
- Nutrient nitrogen deposition; and
- Nitrogen acid deposition and sulphur acid deposition.

PCs for three operating scenarios have been considered:

1. The existing configuration – comprising the seven original boilers and the blast furnace gas flare. This information has been compiled using physical characteristics of the stacks, efflux velocities and existing emission limit values;
2. The commissioning configuration – comprising the seven existing boilers and only one of the new boilers at any one time. These figures have been modelled using ADMS 5; and
3. The new power station configuration – comprising the three existing boilers that will continue to be operated and the two new boilers. These figures have been modelled using ADMS 5.

The process contributions (PCs) have been calculated as percentages of the relevant Environmental Assessment Levels (EALs) (Critical Levels and Critical Loads) in order to determine whether the PC is above or below the significance thresholds, and also to compare the impact of the commissioning configuration (scenario 2) and the new power station configuration (scenario 3) against the existing configuration (scenario 1).

However, in this instance, an assessment of the impact of emissions to air based on comparing PCs with the relevant EALs is not considered suitable to facilitate decision making. This is because this method only examines emissions from sources associated with the existing and new power stations, including the associated flare stack, and does not consider the contribution from the many other emission sources located elsewhere on the steelworks site. Any assessment of the PC, and predicted environmental concentration (PEC), which incorporates the background levels, in comparison with the EALs will therefore not be representative of the true emissions inventory and background concentrations of the steelworks site as a whole.

NRW has therefore decided to base its decision-making on whether or not the new power station represents a net decrease or increase in impacts on air quality between the existing and new power station configurations. Consequently it is this aspect of the operator's assessment that is focussed upon here.

There are four European habitats sites within the 10km screening distance of the site. These are as follows:

- Cefn Cribwr Grasslands (Glaswelltiroedd) (SAC) – 5.1km south east
- Crymlyn Bog / Cors Crymlyn (SAC) – 8.3km north west
- Crymlyn Bog / Cors Crymlyn (Ramsar) – 8.3km north west
- Kenfig / Cynffig (SAC) – 10.3km south east

As mentioned above, modelled PCs are based on the current emission limit value (ELVs) for the existing plant, and those listed in part 2 of Annex V of the Industrial Emissions Directive (IED) for the two new boilers. The model assumes that the PC will be at the ELV; this represents a conservative approach as in reality, the boilers will not frequently operate at the ELV and emissions will, therefore, be below these values for the majority of the time.

Critical Levels

Table 1 below presents the modelled PCs at the European sites for the existing (scenario 1) and new (scenario 3) power stations. A comparison of the modelled PCs as percentages of relevant critical levels between scenario 1 and scenario 3 for all sites is also provided.

Table 1: PCs for the existing power station and new power station given as absolute values in µg/m^3, and as the difference between the existing power station PC and new power station PC as a percentage of the critical levels.

	NO_x Annual Mean (long-term)			**NO_x Daily Mean (short-term)**			**SO_2 Annual Mean (long-term)**		
Critical Level µg/m^3	**30**			**75**			**20**		
Scenario	**1**	**3**	**%age change of CLe**	**1**	**3**	**%age change of CLe**	**1**	**3**	**%age change of CLe**
Cefn Cribwr Grasslands (SAC)	0.4	0.3	**-0.3%**	3.2	2.7	**-0.7%**	1.1	0.7	**-2%**
Crymlyn Bog (SAC) (Ramsar)	0.2	0.2	**No change**	3.2	2.8	**-0.6%**	0.5	0.4	**-0.5%**
Kenfig (SAC)	0.5	0.3	**-0.7%**	5.0	3.1	**-2.5%**	1.1	0.7	**-2%**

Cefn Cribwr Grasslands (SAC)

Oxides of Nitrogen (NO_x)

Table 1 shows that, for both long-term and short-term NO_x, the PCs for the new power station as percentages of the relevant critical levels (CLe) are lower than the corresponding percentage for the existing power station, indicating that levels of NO_x at this location will reduce.

Sulphur Dioxide (SO_2)

Table 1 shows that the PC for the new power station as a percentage of the CLe is lower than the corresponding percentage the existing power station, indicating that levels of SO_2 at this location will reduce.

On this basis, we are satisfied that levels of NO_x and SO_2 will not have a significant effect on the Cefn Cribwr Grasslands SAC.

Crymlyn Bog (SAC / Ramsar)

Oxides of Nitrogen NO_x

Table 1 shows that, for long-term NO_x, the PC for the new power station as a percentage of the CLe is the same as the corresponding percentage for the existing power station, indicating that levels of NO_x at this location will remain the same.

Sulphur Dioxide SO_2

Table 1 shows the PC for the new power station as a percentage of the CLe is lower than the corresponding percentage the existing power station, indicating that levels of SO_2 at this location will reduce.

On this basis, we are satisfied that levels of NO_x and SO_2 will not have a significant effect on the Crymlyn Bog SAC.

Kenfig (SAC)

Oxides of Nitrogen (NO_x)

Table 1 shows that, for long-term NO_x, the PC for the new power station as a percentage of the CLe is lower than the corresponding percentage for the existing power station, indicating that levels of NO_x at this location will remain reduce.

Sulphur Dioxide (SO_2)

Table 1 shows the PC for the new power station as a percentage of the CLe is lower than the corresponding percentage the existing power station, indicating that levels of SO_2 at this location will reduce.

On this basis, we are satisfied that levels of NO_x and SO_2 will not have a significant effect on the Kenfig SAC.

Critical Loads

For nitrogen deposition, Table 2 below presents a comparison of the calculated existing (Scenario 1) and new (Scenario 3) power station PCs for the habitat types that are sensitive to nitrogen deposition, with the relevant critical loads for those habitat types given on the APIS website.

Table 2: PCs for the existing power station and new power station given as absolute values in kg/N/ha/yr, and as the difference between the existing power station PC and new power station PC as a percentage of the nitrogen critical load.

Interest features	Critical Load kg/N/ha/yr	Scenario		%age change of CLo
		1	3	
Crymlyn Bog SAC / Ramsar				
Transition mires and quaking bogs	5-10	0.0289	0.0207	-0.1
Calcareous fens with Cladium mariscus and species of the Caricon davallianae	13-20	0.0289	0.0207	-0.06
Alluvial forests with Alnus glutinosa and Fraxinus excelsior	Not sensitive to N.Dep.	N/A	N/A	N/A
Kenfig SAC				
Fixed dunes with herbaceous vegetation (grey dunes) (acid)	8-10	0.0151	0.0091	-0.08
Humid dunes slacks (calcareous)	15-20			-0.04
Fen orchid – Liparis loeselii	10-20			-0.06
Petalwort – Petalophyllum ralfsii	10-20			-0.06
Dunes with Salix repens ssp. Argentea (Salicion arenariae)	10-20			-0.06
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	20-30			-0.03
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	Unknown			Unknown
Cefn Cribwr SAC				
Marsh fritillary butterfly	10-15	0.0472	0.0321	-0.15
Molinia meadows on calcareous, peaty or clayey-silt-laden soils	15-25			-0.10

For acid deposition, Tables 3 and 4 below presents a comparison of the calculated existing (Scenario 1) and new (Scenario 3) power station PCs for the habitat types that are sensitive to nitrogen acid deposition (Table 3) and sulphur acid deposition (Table 4) with the critical loads for these habitat types given on the APIS website.

Table 3: PCs for the existing power station and new power station given as the absolute values in H^+/ha/yr – HNO_3, and as the difference in existing power station PC and new power station PC as a percentage of the nitrogen acidity critical load.

Interest feature	Critical Load H^+/ha/yr – HNO_3	Scenario		%age change of CLo
		1	3	
Crymlyn Bog SAC / Ramsar				
Transition mires and quaking bogs	0.714	0.0021	0.0015	0.08
Calcareous fens with Cladium mariscus and species of the Caricon davallianae	Not sensitive to N acid dep.			N/A
Alluvial forests with Alnus glutinosa and Fraxinus excelsior		N/A	N/A	N/A
Kenfig SAC				
Fixed dunes with herbaceous vegetation (grey dunes) (acid)	4.303	0.0011	0.0007	-0.01
Humid dunes slacks (calcareous)	4.856			-0.01
Fen orchid – Liparis loeselii	4.856			-0.01
Petalwort – Petalophyllum ralfsii	Not sensitive to N. acid dep.			N/A
Dunes with Salix repens ssp. Argentea (Salicion arenariae)	4.303			-0.01
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	Not sensitive to N. acid dep.			N/A
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.				N/A
Cefn Cribwr SAC				
Marsh fritillary butterfly	2.018	0.0034	0.0023	-0.05
Molinia meadows on calcareous, peaty or clayey-silt-laden soils	2.018			-0.05

Table 4: PCs for the existing power station and new power station given as the absolute values in H^+/ha/yr – H_2SO_4, and as the difference in existing power station PC and new power station PC as a percentage of the sulphur acidity critical load. The combined acid deposition as a percentage of the critical loads as determined by the APIS Critical Load Function Tool is also provided.

Priority habitat / species	Critical Load H^+/ha/yr – HNO_3	Scenario		%age change of CLo	Combined acid deposition using APIS CL Function Tool
		1	2		
Crymlyn Bog SAC / Ramsar					
Transition mires and quaking bogs	0.393	0.0589	0.0379	-5.34	-3.03
Calcareous fens with Cladium mariscus and species of the Caricon davallianae	Not sensitive to S. acid dep.			N/A	N/A
Alluvial forests with Alnus glutinosa and Fraxinus excelsior		0.1178	0.0757	N/A	N/A
Kenfig SAC					
Fixed dunes with herbaceous vegetation (grey dunes) (acid)	4.08	0.0307	0.016	-0.36	-0.35
Humid dunes slacks (calcareous)	4			-0.37	-0.31
Fen orchid – Liparis loeselii	4			-0.37	-0.31
Petalwort – Petalophyllum ralfsii	Not sensitive to S. acid dep.			N/A	N/A
Dunes with Salix repens ssp. Argentea (Salicion arenariae)	4.08			-0.36	-0.55
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	Not sensitive to S. acid dep.			N/A	N/A
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.				N/A	N/A
Cefn Cribwr SAC					
Marsh fritillary butterfly	1.58	0.0968	0.0605	-2.30	-1.85
Molinia meadows on calcareous, peaty or clayey-silt-laden soils	1.58			-2.30	-1.85

Cefn Cribwr Grasslands (SAC)

Nitrogen Deposition

The interest features 'Molinia meadows on calcareous, peaty or clayey-silt-laden soils' and species 'Marsh fritillary butterfly' are sensitive to nitrogen deposition. As percentages of the critical loads, the new power station PCs are lower than the existing power station PCs, indicating a reduction in nitrogen deposition associated with the new power station.

Acid Deposition

Within the Cefn Cribwr Grasslands SAC there are two interest features that are sensitive to acid deposition: 'Molinia meadows on calcareous, peaty or clayey silt-laden soils' and 'Marsh fritillary butterfly'. The operator has calculated the PCs as percentages of the relevant nitrogen acid and sulphur acid CLos and has also used the APIS critical load function tool to determine the combined acid deposition PC as a percentage of the CLos. This assessment shows that the new power station PCs are lower than the existing PCs (as percentages of the relevant CLos), indicating a reduction in both nitrogen and sulphur acid deposition associated with the new power station.

On this basis, we are satisfied that loads of nitrogen, and nitrogen and sulphur acid deposition alone and in combination, will not have a significant effect on the interest features of the Cefn Cribwr Grasslands SAC that are sensitive to those parameters.

Crymlyn Bog (SAC / Ramsar)

Nitrogen Deposition

Two interest features of the Crymlyn Bog SAC / Ramsar are sensitive to nitrogen deposition: 'transition mires and quaking bogs', and 'Calcareous fens with Cladium mariscus and species of the Caricon davallianae'. For both interest features the new power station PCs are lower than the existing power station PCs, indicating a reduction in nitrogen deposition associated with the new power station.

Acid Deposition

Within the Crymlyn Bog SAC and Ramsar there is one interest feature that is sensitive to acid deposition: 'transition mires and quaking bogs'. The operator has calculated the PCs as percentages of the relevant nitrogen acid and sulphur acid CLos and has also used the APIS critical load function tool to determine the combined acid deposition PC as a percentage of the CLos. This assessment shows that the new power station PCs are lower than the existing PCs (as percentages of the relevant CLos), indicating a reduction in both nitrogen and sulphur acid deposition associated with the new power station.

On this basis, we are satisfied that loads of nitrogen, and nitrogen and sulphur acid deposition, will not have a significant effect on the interest features of the Crymlyn Bog SAC / Ramsar that are sensitive to those parameters.

Kenfig (SAC)

Nitrogen Deposition

There are four interest features within the Kenfig SAC that are sensitive to nitrogen deposition; these are:

- Fixed coastal dunes with herbaceous vegetation ("grey dunes");
- Humid dune slacks;
- Dunes with Salix repens ssp argentea (Salicion arenariae); and
- Liparis loeselii - Fen orchid.

For all four features, as percentages of the critical loads, the new power station PCs are lower than the existing power station PCs, indicating a predicted drop in nitrogen deposition associated with the new power station.

Acid Deposition

There are four interest features within the Kenfig SAC that are sensitive to acid deposition; these are:

- Fixed coastal dunes with herbaceous vegetation ("grey dunes")
- Humid dune slacks
- Dunes with Salix repens ssp argentea (Salicion arenariae)
- Liparis loeselii - Fen orchid

For all four features, the operator has calculated the PCs as percentages of the relevant nitrogen acid and sulphur acid CLos and has also used the APIS critical load function tool to determine the combined acid deposition PC as a percentage of the CLos. This assessment shows that the new power station PCs are lower than the existing PCs (as percentages of the relevant CLos), indicating a reduction in both nitrogen and sulphur acid deposition associated with the new power station.

On this basis, we are satisfied that loads of nitrogen, and nitrogen and sulphur acid deposition, will not have a significant effect on the interest features of the Kenfig SAC that are sensitive to those parameters.

Commissioning phase

During the commissioning phase (Scenario 2), one of the new boilers may operate at the same time as the seven existing boilers. The modelled PCs for this phase are slightly in excess of the PCs for the current operating phase (Scenario 1). However, it is important to note that the commissioning phase modelling assumes that the new boiler will operate permanently at its maximum emissions rate throughout the year; in reality this is an overestimate as the new boiler will only operate (under test) for a limited time period and at reduced load, when the existing boilers are in operation. Furthermore it should also be noted that there will be an associated decrease in blast furnace gas flaring emissions during these situations, as the BFG will be the primary fuel for the new boiler.

The modelled PCs for the commissioning phase therefore represent a conservative estimate of the emissions that are likely to occur. Given this and the fact that the commissioning phase is predicted to take only six months, we are satisfied that the planned upgrade will have no significant effect on the interest features of the European sites within the screening distance.

4. Environmental risk

Emissions to air

The operator has undertaken an assessment of the potential impact on all four sites using the criteria set out in the H1 Environmental Risk Assessment screening guidance.

The operator used ADMS 5 modelling software to predict ground level concentrations and deposition rates of pollutants emitted from the seven original boilers and two new boilers for the existing and proposed operational gas configurations. For the existing boilers, the current emission points have been used in the modelling. For the two new boilers, the proposed emission points have been used. PCs have been generated at each of the sensitive receptors for the following parameters:

- Oxides of Nitrogen (NO_x);
- Sulphur Dioxide (SO_2);
- PM_{10}; and
- $PM_{2.5}$

As noted in section 3, in this instance, assessment of the impact of emissions to air based on comparing the PCs with the relevant EALs (including Air Quality Objectives and EU Limit Values) is not considered suitable to facilitate decision making. This is because this method only examines emissions from sources associated with the existing and new power stations, including the associated flare stack, and does not consider the contribution from the many other emission sources located elsewhere on the steelworks site. Any assessment of the PC, and predicted environmental concentration (PEC), which incorporates the background levels, in comparison with the EALs will therefore

not be representative of the true emissions inventory and background concentrations of the steelworks site as a whole.

NRW has therefore decided to base its decision-making on whether the new power station represents a net decrease or increase in impacts on air quality between the existing and new power station configurations. Consequently it is this aspect of the operator's assessment that is focussed upon here.

Table 5 below shows the differences between the maximum PCs outside the site boundary as percentages of the relevant AELs for the existing (Scenario 1) and new (Scenario 3) power stations.

Table 5: PCs for the existing power station and new power station given as the absolute values in mg/m^3, and as the difference in existing power station PC and new power station PC as a percentage of the relevant EALs.

Pollutants	Averaging Period	EAL (mg/m^3)	Scenario		%age change of AEL
			1	3	
NO_2	1 hour (99.79th %ile)	200	49.9	42.8	-7.1
	Annual	40	8.6	5.6	-3.0
PM_{10}	24 hour (90.41st %ile)	50	4.7	2.9	-1.8
	Annual	40	1.3	0.8	-0.5
$PM_{2.5}$	Annual	25	1.3	0.8	-0.5
SO_2	15 minute (99.9th %ile)	266	240.1	205.7	-34.4
	1 hour (99.73rd %ile)	350	221.1	169.7	-51.4
	24 hour (99.18th %ile)	125	152.3	110.4	-41.9
	Annual	50	19.5	11.2	-8.3
CO	8 hour (max daily running)	10000	2.0	0.0	-2.0

For all parameters, the maximum PCs outside the site boundary as percentages of the relevant EALs for the new power station are lower than the corresponding figures for the existing power station, showing a net reduction in the emissions. This conclusion has been verified by check modelling carried out by NRW, which also indicates that there will be a net reduction in maximum predicted PCs outside the site boundary following commissioning of the new boilers and subsequent decommissioning of four of the existing boilers.

Commissioning phase

During the commissioning phase (Scenario 2), one of the new boilers may operate at the same time as the seven existing boilers. The modelled PCs for this phase are slightly in excess of the PCs for the current operating phase (Scenario 1). However, it is important to note that the commissioning phase modelling assumes that the new boiler will operate permanently at its maximum emissions rate throughout the year; in reality this is an overestimate as the new boiler will only operate (under test) for a limited time period and at reduced load, when the existing boilers are in operation. Furthermore it should also be noted

that there will be an associated decrease in blast furnace gas flaring emissions during these situations, as the BFG will be the primary fuel for the new boiler.

The modelled PCs for the commissioning phase therefore represent a conservative estimate of the emissions that are likely to occur. Given this and the fact that the commissioning phase is predicted to take only six months, we are satisfied that emissions during the commissioning phase are unlikely to contribute significantly towards the background levels of the pollutants listed in Table 5.

Emissions to water

No additional release points to surface water will be introduced as part of this variation. There will be an increase in the amount of boiler blowdown and purge waters from the cooling towers, which will be discharged to the existing effluent treatment facilities onsite and then discharged to Swansea Bay via the Long Sea Outfall (W1). In addition there will be surface water runoff (rainwater) to the existing discharge points at Arnallt Culvert (W2) and Swansea Bay (W3).

The additional blowdown and process effluent produced by the new cooling towers and boilers, as well as surface waters, will be mixed and treated with large quantities of other site effluent prior to being discharged to Swansea Bay via release point W1. This discharge is controlled through the existing emission limits at W1. The operator has used the H1 software tool to assess the impact of the additional emissions of boiler blowdown water and cooling tower purge water during the commissioning and operational phases.

As a result of the additional blowdown and process effluent associated with the new cooling towers and boilers in full operation, the volume of wastewater emissions at W1 will increase by approximately 600 m^3/hr, comprising 300 m^3/hr of cooling tower purge and 300 m^3/hr of boiler blowdown. The additional discharge will increase the discharge rate to 2,615 m^3/hr (based on monthly monitoring data collected between January 2012 and December 2014), which is within the current permitted flow rate of 6,000 m^3/hr.

During the commissioning phase, the additional increase in discharge to Swansea Bay is anticipated to be 225 m^3/hr comprising purge water from one new cooling tower (150 m^3/hr) plus one new boiler blowdown (75 m^3/hr) with no offset for closure of the existing boilers. Therefore the total discharges during the commissioning phase would equate to 2,390 m^3/hr on average which is also within the current permitted flow rate of 6,000 m^3/hr.

The water quality of the blowdown water and cooling tower purge water for the new power station will be similar to that of the current emissions from similar sources. The waters will not contain any of the polluting parameters specified in the existing permit apart from very small amounts of total suspended solids and biocides. Consequently they will therefore not add significantly to the concentrations and loads of parameters currently being discharged. The mean monthly concentrations from W1 will remain within the current emission limits.

The water discharged will also be treated by the existing onsite treatment facilities to ensure the discharged water continues to meet the emission limits specified in the environmental permit.

We are satisfied that the existing water treatment facilities at the site have sufficient capacity to accept and adequately treat the additional emissions to water associated with the new power station. We are satisfied therefore, that the possibility that the existing emission limits will be exceeded is extremely low.

Noise

The operator has carried out a noise impact assessment for the new power station, which includes modelling of noise associated with the new boilers using CadnaA noise modelling software. This modelling represents a worst case scenario in that it assumes a continuous 24 hour operation with no attenuation due to ground effects or physical screening from surrounding buildings or topographical features. The noise impact assessment also includes baseline noise surveys, which were carried out in accordance with the requirements of BS4142 – 2014, and correspond well with the Welsh Government's noise map of the same area.

The modelling results indicate that the predicted equivalent continuous downwind octave-band sound pressure levels originating from the proposed new boilers at all receiver locations will be less than existing background sound, and can therefore be considered as low impact. As part of the determination process, NRW conducted check calculations on the modelling data supplied by the operator; this confirmed that the predicted equivalent continuous downwind octave-band sound pressure levels would be low impact relative to existing background sound levels.

We are satisfied that the noise impact from the new power station will be within acceptable levels.

5. Operating techniques

BAT Assessment

The operator conducted an assessment of alternative technologies, namely Boiler Turbo Alternator (BTA) units and Combined Cycle Gas Turbines (CCGT), for the new power station to ascertain which technology would best generate power from the available process gases at the Port Talbot site.

Although the efficiency of the CCGT unit is slightly higher (at approximately 44%) when compared to the BTA unit (approximately 41%), the BTA was selected as the preferred technology for the Port Talbot Site.

The operator has carried out an assessment of the new power station against the BAT conclusions listed in the Iron and Steel BRef (2012) and the Large Combustion Plant BRef (2006). We are satisfied that the new power station will comply with the BAT conclusions described in both documents. The assessment also compares the facility with the BAT conclusions described in the draft Large Combustion Plant BRef (published in draft in 2013) so as to 'futureproof' the design against the changes that may arise from the revision of the BRef.

6. Use of conditions other than those from the template

Minister Stein conditions

The previous variation (ref. EPR/BL7108IM/V014) omitted in error a condition requiring the operator to maintain the availability of the coke side arrestment system (the Minister Stein) to stipulated levels during planned and unplanned outages. We have reinstated this condition and associated monitoring requirements in Schedule 3 of the permit.

7. Pre-operational conditions

We have included three pre-operational conditions in relation to the operation of the new power station which the operator will need to satisfy before operation of the new boilers and associated plant can commence. These are summarised as follows:

- PO 1 requires the operator to provide NRW with detailed designs for the two new boilers and associated plant and infrastructure for approval six months before commencement of commissioning and start-up. This is to ensure that the designs conform to descriptions and specifications given in the variation application and are therefore representative of the environmental impact described in the application; and
- PO 2 requires the operator to provide details of minimum start-up load and minimum shutdown loads for the two new boilers for approval by Natural Resources Wales three months before the commencement of commissioning and start-up. This is to enable the population of table S5.1 which is included in the permit as a result of the requirements of Chapter III of the IED.

8. Improvement Conditions

We have included four improvement conditions in the permit as part of this variation.

In relation to the new power plant, we have included the following:

- IC 11, which requires the operator to inform NRW of the date of commencement of each of the activities listed in the project timeline included with the application;
- IC 12, which requires the operator to inform NRW of the date of cessation of use of the existing boilers that are included in the decommissioning plan to enable NRW to inform Defra of the need to modify the Transitional National Plan;
- IC 13, which requires the operator to report emissions of particulate matter, sulphur dioxide and oxides of nitrogen for all existing LCPs to the National Emissions Reduction Plan (NERP) registry;
- IC 14, which requires the operator requires the operator to submit for approval to Natural Resources Wales a commissioning plan for the two new boilers, and a decommissioning plan for Service Boilers 4 and 5, Boiler 5 and Mitchell Boiler to demonstrate that the two new boilers will not operate concurrently whilst Service Boilers 4 and 5, Boiler 5 and Mitchell Boiler are still operating; and
- IC 15, which has been included to clarify the role of the operator and that of another company that holds a separate extant permit at the Port Talbot Steelworks installation (Harsco Metals Group Ltd.) in relation to the blast furnace iron pouring and plating activity. This improvement condition requires the operator to determine (within twelve months of the date of the variation) which company has responsibility for pouring molten blast furnace slag into the slag plating pools. A similar improvement condition has been included in Harsco Metals' permit.

9. Emission limits

The two new boilers fall within the definition of 'new' large combustion plant as described in article 30(2) of the IED. We have therefore specified emission limits for the new boilers which are in line with Part 2 of Annex V of the IED. As the intention is to fire the boilers on a blend of process gases then the provisions of article 40(1) apply. For oxides of nitrogen, sulphur dioxide, particulate and carbon monoxide we have specified emission limits that encompass the range of limits outlined in Part 2 of Annex V for gas-fired combustion plant that is not a gas turbine or gas engine, as follows:

- For SO_2 we have used the emission limits values given in Part 2(3) of Annex V;
- For NO_x and CO we have used the emission limit values given in Part 2(6) of Annex V; and
- For particulate we have used the emission limit values given in Part 2(8) of Annex V.

We have also included a set of footnotes requiring the operator to calculate the emission limits for blended fuels based on the description given in article 40(1).

Annex 1: decision checklist

This document should be read in conjunction with the application and supporting information and notice.

Aspect considered	Justification / Detail
Consultation	
Scope of consultation	The consultation requirements were identified and implemented. The decision was taken in accordance with RGN 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements.
Responses to consultation and web publicising	The web publicising and consultation responses (Annex 2) were taken into account in the decision. The decision was taken in accordance with our guidance.
Operator	
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with EPR RGN 1 Understanding the meaning of operator.
European Directives	
Applicable directives	All applicable European directives have been considered in the determination of the application. We have considered the changes to the internal power generation facility in the context of the requirements of Chapter III of the Industrial Emissions Directive, and made changes to the permit in accordance with this. See **Key Issues** section.
The site	
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility including the location of the part of the installation to which this permit applies on that site. A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary.
Biodiversity, Heritage, Landscape and Nature Conservation	The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat .

Aspect considered	Justification / Detail
	A full assessment of the application and its potential to affect the sites has been carried out as part of the permitting process. We consider that the application will not affect the features of the sites. Formal consultation has been carried out with the Conservation Body in Wales. The consultation responses (Annex 2) were taken into account in the permitting decision. See **Key Issues** section.
Environmental Risk Assessment and operating techniques	
EIA	In determining the application we have considered the Environmental Statement. We have also considered the planning permission and the committee report approving it.
Environmental risk	We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory. The assessment shows that, applying the conservative criteria in our guidance on Environmental Risk Assessment all emissions may be categorised as environmentally insignificant. See **Key Issues** section.
Operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes. The proposed techniques / emission levels for priorities for control are in line with the benchmark levels contained in the TGN and we consider them to represent appropriate techniques for the facility. We consider that the emission limits included in the permit reflect the BAT for the installation. See **Key Issues** section.
The permit conditions	
Use of conditions other than those from the template	Based on the information in the application, we consider that we need to impose conditions other than those in our permit template, which was developed in consultation with industry having regard to the relevant legislation. See **Key Issues** section.

Aspect considered	Justification / Detail
Pre-operational conditions	Based on the information in the application, we consider that we need to impose pre-operational conditions. See **Key Issues** section.
Improvement conditions	Based on the information on the application, we consider that we need to impose improvement conditions. We have imposed improvement conditions to ensure that: appropriate measures are in place to ensure operation of the new and existing boilers is as described in the variation application report 'The Tata Steel Port Talbot Steelworks (Power Generation Enhancement) Environmental Permit BL7108IM Variation Application Report' (Reference 47073873) to ensure that emissions to air and water are controlled and that the impact on the local environment is no more than that which is indicated in the application. See **Key Issues** section.
Incorporating the application	We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process. These descriptions are specified in the Operating Techniques table in the permit.
Emission limits	We have decided that emission limits should be set for the parameters listed in the permit. See **Key Issues** section.
Monitoring	We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.
Reporting	We have specified reporting in the permit.
Operator Competence	
Environment management system	There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.

Annex 2: Consultation and web publicising responses

Summary of responses to consultation and web publication and the way in which we have taken these into account in the determination process.

Response received from
Neath Port Talbot County Borough Council – Planning Department
Brief summary of issues raised
None
Summary of actions taken or show how this has been covered
N/A

Response received from
Neath Port Talbot County Borough Council – Environmental Health Department
Brief summary of issues raised
None
Summary of actions taken or show how this has been covered
N/A

Response received from
Public Health Wales
Brief summary of issues raised
1. The Regulator should be satisfied that the Environmental Management System is suitably robust for site operations and off-site consequences; 2. The new development is included in the existing noise plan to ensure action is taken to ensure it does not cause annoyance to nearby residents; 3. There is the potential for emissions during construction and it is important that these are adequately controlled so that they do not adversely impact on human health; and 4. Emissions to air and controlled waters from the boilers should meet permitted emission limits.
Summary of actions taken or show how this has been covered
1. Tata Steel operates an Environmental Management System (EMS) for the steelworks site as a whole to ISO 14001 standards. The new power station development will be incorporated into this EMS; 2. Noise impact has been modelled and found to be insignificant, provided that the proposed noise control techniques outlined in the application are implemented, which are in line with BAT as described 'H3 Noise assessment and control'. We have included the noise impact assessment report in the Operating Techniques table of the permit; 3. Emissions arising from the construction phase of the new power plant development are outside the scope of the environmental permit; and 4. We have specified limits on emissions to air from the new boilers that are compliant with the Industrial Emissions Directive. Emissions to water from the new boilers will be combined with emissions from the existing boilers and routed to the steelworks' main effluent treatment plant for treatment prior to discharge to sea via the existing emission points W1 and W2 with no change to the existing emission limit values.