

2016 Annual Performance Report

Aberthaw Power Station

Permit Number: RP3133LD

March 2017

Summary

This document gives details on the performance of station activities over 2016, as required by condition 4.2.2 of the Station's Environmental Permit (EP), RP3133LD.

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1. Operational Update

In 2016 there were no changes to the operational activities and no Environmental Permit variations. The station's load factor was equivalent to 50% with no major outages.

A judgement by the Court of Justice of the European Union (CJEU) on the 21st September 2016 determined two changes for the future regulation of Aberthaw under the Industrial Emissions Directive (IED) (2010/75/EU): revision of the annual emissions allowance within the Transitional National Plan (TNP) and revision of the Emission Limit Value (ELV) for Oxides of nitrogen (NOx). The TNP annual emissions allowance was reduced with effect from the date of Judgement and the ELV revision is currently being determined by Natural Resources Wales (NRW).

The station was successful in securing a generation contract in the third capacity market auction for the period Quarter 4 2020 to Quarter 3 2021.

2. Review of Results for Emission Monitoring

2.1. Air Quality Review

There have been no significant changes to the activities, assumptions or parameters used in the assessment of the impact of the air emissions submitted with the application. Since the original permit application in 2006 there has been a reduction in the NOx ELV to reflect improvements made in NOx control.

Table 1 below summarises the results for point source emissions to air during 2016. The data shows that there have been no exceedences against EP ELVs and therefore, that the impacts of the activities will be less than the initial site assessment.

Table 1: Summary of compliance with ELVs for point source emissions to air for 2016 (Table S3.1 and S3.4 EP)

Emission Point	Parameter	EP ELV	Validated Data	Units	Reference Period
Windshield A1	Sulphur Dioxide	350	65.32-198.53	mg/m ³	Calendar monthly mean
		440	217.48		95%ile of validated daily means within a calendar year
	Oxides of Nitrogen	1050	467.41-740.65	mg/m ³	Calendar monthly mean
		1080	805.30		95%ile of validated daily means within a calendar year
		33,000	17,152.10	tonnes	Annual Limit
	Dust	20	4.83-10.67	mg/m ³	Calendar monthly mean
		35	11.43		95%ile of validated daily means within a calendar year

2.2. Water Quality Review

There have been no significant changes to the activities, assumptions or parameters used in the assessment of the impact of the water emissions submitted with the application. Since the original permit application in 2006 the Mass ELVs for cadmium, lead and zinc have been removed because relatively high background levels compared to discharge concentrations have resulted in unreliable determinations of differential concentrations. Monthly FGD Absorber Outlet Concentration ELVs for lead and zinc have been added. The Daily FGD Absorber Outlet Concentration ELVs for mercury has been removed due to high levels of uncertainty. And in 2016 the pH ELV was revised following a trial which determined no adverse environmental impact on the marine environment to enable a wider range of coals to be sourced. During 2016, the Station has continued to use the same independent external laboratory for analysing water samples which it changed to in September 2009 following difficulties with previous laboratories. Duplicate samples have continued to be collected for monthly samples which generally continue to show good repeatability.

Table 2 below summarises the results for point source emissions to water during 2016. The data shows that for emission point W2, into the Bristol Channel, there was one exceedance against the EP instantaneous minimum pH ELV. This incident occurred on the 21st May 2016 when the pH fell below the permit limit for a period of approximately 24 minutes. The incident was investigated and it is thought that the CW pump drain down displaced residual absorber effluent in the CW system on a falling tide may have been the cause. Procedures have been updated to ensure a CW pump is operating or the site discharge is shut down for the duration of drain-down. A review of the pH at the outfall from a temporary probe, the quantity discharged and tidal conditions indicated that the low pH effluent was not discharged to the Bristol Channel and NRW confirmed that the event is not considered to be a breach of permit conditions. Considering this and that there were no other EP ELV exceedances for W2 it can be concluded that the impacts of the activities will be less than the initial site assessment.

The data shows that for FGD Absorber Outlet emission points into the seawater treatment pond, there were exceedances against the ELV for Mercury, Lead and Zinc on Unit 7, for Zinc on Unit 8 and for Mercury on Unit 9, however, the final site discharge was within the limits. For Unit 7 there were 3 individual mercury exceedances in June, August, and September whilst for Unit 9 there was 1 individual mercury exceedance in March after accounting for laboratory uncertainty. Duplicate samples varied between 10-22% indicating high uncertainty in measurements. For Unit 7 there was 1 individual lead exceedance in April after accounting for laboratory uncertainty with a variance of <1% between duplicate samples indicating minimal uncertainty in measurements. For Unit 7 there were 2 individual zinc exceedances in April and November and for Unit 9 there were 2 individual zinc exceedances in January and November after accounting for laboratory uncertainty. Duplicate samples varied between 1-39% indicating high uncertainty in measurements.

An investigation into the elevated FGD Absorber Outlet results has been unable to identify a root cause other than measurement uncertainty. There is no consistency of elevated metal concentrations or apparent correlation with fuel source or operating conditions. There has been no corresponding increase in the final site discharge metal concentrations indicating that the impact of FGD operation is in line with the original site assessment. NRW have concluded that the elevated FGD Absorber Outlet discharges associated with the composite sampling regime are considered to be approaches to limit due to uncertainty in the measurements.

It should also be noted that annual marine sediment and biota surveys have been undertaken to assess trace element discharge impacts, which have confirmed that although there has been some minor increase in mercury in the immediate vicinity of the outfall, this declines to background levels within a few hundred metres and has shown no discernible impact on the populations of the target species or on the overall communities in Limpert Bay.

The station has experienced many difficulties with the sampling and analysis regime for the FGD Absorber Outlets since it was implemented in 2008 and will continue to work with the regulator to resolve the issues.

Table 2: Summary of compliance with ELVs for point source emissions to water for 2016 (Table S3.2, S3.3 and S3.4 EP)

a) Emission Point W2 (Cooling Water Outlet)

(Note: Brackets () used to denote value following exclusion of outliers. **Bold Red Font** used to indicate exceedances)

Emission Point	Parameter	EP ELV	Measured Data	Units	Result Type	Reference Period	
W2	Differential total suspended solids	50	20	mg/l	Maximum	Weekly average of daily samples	
	Ammoniacal nitrogen	0.1	0.1	mg/l		Monthly average of daily samples (above background)	
	Differential temperature	13.5	10.0	°C		98%ile of continuous daily average values	
	Total hydrocarbon oil	3	0.2	mg/l		Monthly average of daily samples	
	pH		5.6	3.2 (5.6)	pH units	Minimum	Instantaneous
			5.8	5.9			95%ile of instantaneous measurements
			8.5	8.3		Maximum	95%ile of instantaneous measurements
	Mercury	60	30.2	kg	Annual	Annual Mass Release	

b) Emission Point SWTP1, SWTP2, SWTP3 (FGD Absorber Outlets)

(Note: Brackets () used to denote maximum value following exclusion of outliers. **Bold Red Font** used to indicate exceedances)

Emission Point	Parameter	EP ELV	Measured Data	Units	Result Type	Reference Period
SWTP1 (U7 FGD Absorber Outlet)	Mercury	0.0005	0.00080 (0.0004)	mg/l	Maximum	Monthly average value (above background)
	Cadmium	0.0002	0.00016			
	Lead	0.004	0.0054 (0.0037)			
	Zinc	0.01	0.024 (0.011)			
SWTP2 (U8 FGD Absorber Outlet)	Mercury	0.0005	0.00050	mg/l	Maximum	Monthly average value (above background)
	Cadmium	0.0002	0.00016			
	Lead	0.004	0.0034			
	Zinc	0.01	0.025 (0.013)			
SWTP3 (U9 FGD Absorber Outlet)	Mercury	0.0005	0.00080 (0.00050)	mg/l	Maximum	Monthly average value (above background)
	Cadmium	0.0002	0.00001			
	Lead	0.004	0.0026			
	Zinc	0.01	0.012			

3. Annual Production/Treatment Data 2016 (Table S4.2 EP)

LCP 283: Units 7,8 and 9 coal-fired boilers	7,099	GWh
LCP 423: GT7, GT8 and GT9 gas oil-fired black start gas turbines	0.053	GWh

4. Performance Parameters 2016 (Table S4.3, EP)

See IED AR1 and HR1 already submitted to NRW.

5. LCP283 Cumulative Rolling Breakdown and Malfunction Hours

See IED BD1 already submitted to NRW.

6. Contamination/Decontamination of Site

There have been no incidents or emissions which may have caused any site contamination during 2016, and, therefore, no requirement to decontaminate the site during 2016.