Environment Agency

Review of an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010 (as amended)

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/LP3833LM
The Operator is: Corby Power Limited
The Installation is: Corby Power Station
This Variation Notice number is: EPR/LP3833LM/V004

What this document is about

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 the 1 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 IED provides a period of transition towards the new ELVs via Article 32, the Transitional National Plan (TNP). It also makes provision for plant that wish to be exempted from compliance with the new ELVs in Article 33, the Limited Life Derogation (LLD). Other derogations include limited operating hour regimes for sites using 500 hr or 1500 hr derogations. There are also options for exemption from emission limits based on operating hours.

The operator has submitted responses to our notices requiring information, issued under regulation 60(1) of the Environmental Permitting Regulations (EPR), which has provided us with information on which compliance route they wish to follow for each LCP. The responses also includes specific details relating to each LCP, necessary for accurate implementation of the IED requirements. A copy of the regulation 60 notice and the operator's response is available on the public register.

We have reviewed the permit for this installation, including all variations since the last permit consolidation, and referred to the operator's responses to the regulation 60 notices requiring information. This is our decision document, which explains the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the compliance routes and, where relevant, the emissions limits proposed by the Operator for each LCP on the installation. This review has been undertaken with reference to the:

- Chapter III and annex V of the IED
- "IED BAT ESI Review Paper, 28 October 2014" produced by the Environment Agency (referred to as the "2014 ESI BAT review paper" in this document)
- "Electricity Supply Industry – IED compliance protocol for Utility Boilers and Gas Turbines", published by the Joint Environmental Programme.

It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as implementing the chapter III IED compliance of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. It also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and philosophy and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to chapter III review.

How this document is structured

Glossary

1. Our decision
2. How we reached our decision
3. The legal framework
4. Key Issues

Annex 1 – Review and assessment of changes that are not part of the Chapter III IED derived permit review.

GLOSSARY

Baseload	means: (i) as a mode of operation, operating for >4000hrs per annum; and (ii) as a load, the maximum load under ISO conditions that can be sustained continuously, i.e. maximum continuous rating
BAT	best available techniques
BOFA	boosted over fire air
BREF	best avalable techniques reference document
CCGT	combined cycle gas turbine
Derogation	as set out in Article 15(4) of the IED
Emergency use	<500 operating hours per annum
ELV	emission limit value set out in either IED or LCPD
FGD	flue gas desulphurisation
GT	gas turbine
IED	Industrial Emissions Directive 2010/75/EC
LCP	large combustion plant – combustion plant subject to Chapter III of IED
LCPD	Large Combustion Plant Directive 2001/80/EC
LLD	Limited Life Derogation
MCR	Maximum Continuous Rating
Mid merit	1500-4000 operating hours per annum
MSUL/MSDL	Minimum start up load/minimum shut-down load
OCGT	Open Cycle Gas Turbine
Peaking	500-1500 operating hours per annum
Part load operation	operation during a 24 hr period that includes loads between MSUL/MSDL and maximum continuous rating (MCR)
SCR	selective catalytic reduction

SNCR	selective non catalytic reduction

1 Our decision

We have decided to issue the Variation Notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains many conditions that concern the operation of the non-LCP part of the installation taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

2.1 Requesting information relating to the requirements of Chapter III of and Annex V to the IED

We issued a Notice under Regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 31/10/2014 requiring the Operator to provide information for each LCP they operate, including:

- The type of plant, size and configuration.
- The proposed compliance routes.
- Minimum start up and shut down loads.
- The proposed emission limits and how they accord with the 2014 BAT review paper.
- For gas fired plant, whether they wish to apply for derogation from monitoring when on standby fuels.

The Regulation 60 Notice response from the Operator was received on 31/03/2015

We considered that the response did not contain sufficient information for us to commence determination of the permit review. We therefore issued a further information request to the Operator. Suitable further information was provided by the Operator on 24/06/2015.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

2.2 Alternative compliance routes

In their Regulation 60 Notice response, the operator initially requested multiple compliance routes be considered for their LCP because at that point they had not decided which route they wanted to apply. The routes for each LPP requested were: Article 33 – LLD, Article 32 – TNP, Article 30(2) Annex V Part 1 – LHD, Article 30(2) Annex V Part 1 – 500 hour emergency operation

We were only able to issue the variation notice for single compliance routes per LCP and the operator confirmed which route(s) they wanted in the variation notice by email dated 17/12/2015. The confirmed route was:

Limited Life Derogation

This is what is considered in this decision document.

3 The legal framework

The Consolidated Variation Notice will be issued under Regulations 18 and 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

Meeting the requirements of the IED

The table below shows how each requirement of the IED has been addressed by the permit conditions.

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IED Article Reference	IED requirement	Permit condition
30(6)	If there is an interruption in the supply of gas, an alternative fuel may be used and the permit emission limits deferred for a period of up to 10 days, except where there is an overriding need to maintain energy supplies. The EA shall be notified immediately.	2.3.6
32(4)	For installations that have applied to derogate from the IED Annex V emission limits by means of the transitional national plan, the monitoring and reporting requirements set by UK Government shall be complied with.	Not applicable
33(1)b	For installations that have applied to derogate from the IED Annex V emission limits by means of the Limited Life Derogation, the operator shall submit annually a record of the number of operating hours since 1 January 2016;	2.3.11 4.2.2e
37	Provisions for malfunction and breakdown of abatement equipment including notifying the EA.	Not applicable
38	Monitoring of air emissions in accordance with Ann V Pt 3	3.5, 3.6
40	Multi-fuel firing	Schedule 3, Table 3.1
41(a)	Determination of start-up and shut-down periods	2.3.12 Schedule 1 Table S1.5
72b	For combustion plants which do not operate more than1500 operating hours per year as a rolling average over a period of 5 years, the number of operating hours per year.	Not applicable
Ann V Pt 1(1)	All emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised O2 content of 6 % for solid fuels, 3 % for combustion plants, other than gas turbines and gas engines using liquid and gaseous fuels and 15 % for gas turbines and gas engines.	Schedule 6, Interpretation
Ann V Pt 1	Emission limit values	3.1.2 Schedule 3, Table S3.1
Ann V Pt 1	For plants operating less than 500 hours per year, record the used operating hours	2.3.7, 2.3.8, 4.2.2e
Ann V Pt 1(6(1))	Definition of natural gas	Schedule 6, Interpretation

IED Article Reference	IED requirement	Permit condition
Ann V Pt 2	Emission limit values	3.1.2 Schedule 3, Table S3.1
AnnV Pt 3(1)	Continuous monitoring for >100MWth for specified substances	3.5, 3.6 Schedule 3, Table S3.1
AnnV Pt 3(2, 3, 5)	Monitoring derogations	3.5.1 Schedule 3, Table S3.1
AnnV Pt3(4)	Measurement of total mercury	Not applicable
AnnV Pt3(6)	EA informed of significant changes in fuel type or in mode of operation so can check Pt3 (1-4) still apply	2.3.1 Schedule 1, Table S1.2
AnnV Pt3(7)	Monitoring requirements	3.5.1 Schedule 3, Table S3.1
AnnV Part 3(8,9,10)	Monitoring methods	3.5, 3.6
AnnV Pt 4	Monthly, daily, 95%ile hourly emission limit value compliance	3.5.1 Schedule 3, Table S3.1
AnnV Pt7	Refinery multi-fuel firing SO2 derogation	Not applicable

4. Key Issues

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

Where relevant and appropriate, we have incorporated the techniques described by the Operator in their Regulation 60 Notice response as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the Consolidated Variation Notice.

The variation notice uses updated LCP numbers in accordance with the most recent EIONET references. The LCP references have changed as follows:

- LCP **127** is changed to LCP **70**
- LCP **128** is changed to LCP **71**

This installation was a base load CCGT plant which now operates, intermittently in a two-shifting pattern due to the changing market conditions. The installation also operates in open cycle mode. This plant therefore has applied to meet the requirements of the LLD compliance route but to include the option to operate in open cycle mode if and when required.

The operator was unable to justify the methodology used for the data provided for Net rated thermal load. The Environment Agency has set an improvement condition to be set to receive this information within the 1st year of IED coming into force.

The operator wished for clarification on how conditions from the current permit map across to the new template, in particular, condition 3.1.5

The current permit is on an original PPC permit template and condition 3.1.5 brings the permit into the standard conditions within the latest template and to be consistent with the IED requirements. For regulatory compliance the current approach to periodic monitoring of groundwater and soil remains valid.

In general, this permit consolidates and simplifies monitoring and reporting and the Area Compliance Officer will provide guidance within 2 weeks of the coming into force of this permit so that the operator understands the reporting and monitoring requirements outlined in the updated permit.

LCP 70 and LCP 71

Each of these LCPs consists of a 407MW GT with an HRSG which vent via a single flue within a single windshield at emission point A1 and A2 respectively. There is a single steam turbine which is able to accept steam from each HRSG.

The units burn natural gas with gas oil as a standby fuel.

Compliance Route:

The operator has proposed to operate each LCP under the LLD route.
We have limited the use of open cycle of each LCP to 500 hours.

Net Rated Thermal Input:

The Applicant has stated that the Net Thermal Input is 407MWth. They have justified this figure by providing additional information but this is insufficient and we have set an improvement condition.

Minimum start up load and Minimum shut-down load:

The Operator has defined the “minimum start up load” and “minimum shut-down load” for the LCP in their response to question 6 of the Reg 60, in terms of:

The output load (i.e. electricity generated) 70Mwe; and this output load as a percentage of the rated output of the combustion plant (56%) and/or as one of three criteria that suit the technical characteristics of the plant, which can be met at the end of start-up. For shut down this has been defined as electrical output load of 50MWe; and this output load as a percentage of the rated output of the combustion plant (50%).

In addition Start-Up and Shut-down has been defined separately for the open cycle operation of LCP70 and LCP71. The period of start-up should not be longer than 20 minutes.

We agree with all of these definitions and have set these thresholds in table S1.5 of the permit accordingly. Standard permit condition 2.3.8 has been set to define the period of start up and shut down, referring to the thresholds in this table.

Emission limits:

The operator has proposed limits in line with annex V of the IED and the 2014 BAT review paper. Consequently we have accepted the proposed limits and incorporated them into table S3.1 of the permit.

Gas Turbines:

Sulphur dioxide emissions from natural gas firing will be reported on the basis of the fuel sulphur content without continuous or periodic monitoring since only trace quantities of sulphur are present in UK natural gas. Likewise, dust emissions from natural gas firing will be reported on the basis of emission factors without continuous or periodic monitoring. Natural gas is an ash-free fuel and high efficiency combustion does not generate additional particulate matter. The fuel gas is always filtered and, in the case of gas turbines, the inlet air is also filtered resulting in a lower dust concentration in the flue than in the surrounding air.

The IED Annex V ELVs for oxides of nitrogen and carbon monoxide apply to OCGTs, CCGTs and mechanical drive gas turbines when the load is >70%. This has been interpreted as 70% of the rated output load. The rated output load used here is the same as that used for calculating the percentage load when specifying the end of start-up and beginning of shut-down.

The approach to ELV setting was as follows:-

The approach to setting the emission limit for Oxides of Nitrogen and Carbon Monoxide followed the principles set out in the 2014 ESI BAT review paper.

All measurements in mg/m_3	95%ile of hourly averages	95%ile of 24 hourly averages	Monthly averages	Daily Mean of Validated Hourly Averages	Hourly Mean
Current (GT1 & GT2)	-	-	-	125 (230)	375 (690)
ESI suggested ELVs	**None Set**	**125 (230)**	**114(210)**		

The current ELV for both GT1 and GT2 for NOx is $125mg/m^3$ ($230mg/m^3$) daily mean (gas oil in brackets) and 375mg/m3 ($690mg/m^3$) hourly mean. Under the LLD no 95%ile of hourly averages is required so the current ELV for the daily mean was converted to the other two reference periods using the rules set out in IED Annex V.

There is currently no CO ELVs set and, as a result it is accepted that no CO ELVs require setting for LLD plant as per the ESI BAT review paper.

The operator did not request for emission limit values to be set for MSUL to <70% load and none were set.

This approach introduces a monthly average which is considered by the operator as being restrictive if operating in low usage. The operator requested that the reporting of monthly averages should include caveats so that sporadic

operation should only be reported if the >3 days of data is available. In this case we have not included this as a permit condition but will remind the operator of the sector approach to reporting highlighted in the ESI Compliance Protocol which condition 2.3.2 refers to.

Standby fuels:

The operator normally uses gas fuel and has applied to use gasoil as a standby fuel. Since it is BAT to use the cleaner gas fuel, gasoil use is limited to 10 days a year. This makes the permit consistent with others within the sector and allows the Environment Agency to reassess the impacts to air quality for periods of greater than 10 days a year – a period of time deemed suitable in the event of an extended gas interruption – if the operator wishes to re-apply for that option.

Reporting efficiency:

In order to ensure the efficiency of plant using fossil fuels or biomass is maximised and regularly recorded, condition 1.2.1(c), condition 4.2.2(b) and table S4.2 have been added to the permit.

Notifications:

Schedule 5, Part C, is not required for this installation as it only takes account of the malfunction and breakdown requirements of abatement plant that this installation does not have.

Monitoring & standards:

Standards for assessment of the monitoring location and for measurement of oxygen, water vapour, temperature and pressure have been added to the permit template for clarity.

Resource efficiency metrics:

A more comprehensive suite of reporting metrics has been added to the permit template for ESI plant. Table S4.2 “Resource Efficiency Metrics” has been added requiring the reporting of various resource parameters, as this is an Electrical Supply Industry (ESI) power plant. This table is being used for all ESI plant.

Additional IED Chapter II requirements:

Condition 3.1.6 relating to protection of soil, groundwater and groundwater monitoring, has been added in compliance with IED requirements.
Conditions 4.3.1 and 4.3.2 relating to notifications have been amended in compliance with IED requirements.

Annex 1: Review and assessment of changes that are not part of the Chapter III IED derived permit review.

We have used the opportunity of permit variation to correct errors in previous variations these are listed below:-

Condition 2.4 / Table 1.3 – Improvement Conditions - has been updated to include 2 improvement conditions; the first is a administrative one relating to ensuring that we get the final Large Combustion Plant Directive data. The second is relating to confirmation of thermal input.

Schedule 7 – Site Plan - was updated to reflect the emission points and to clarify the extent of the boundary in the required format.