

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/ZP3130LJ
The Operator is: SSEPG (Operations) Limited
The Installation is: Burghfield Power Station
This Variation Notice number is: EPR/ZP3130LJ/V002

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 a response 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 response also includes specific details relating to each LCP, necessary for accurate implementation 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 response 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 and an updated address for the operators registered office.

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

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
BREF	best available 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
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
MCR	Maximum Continuous Rating
Mid merit	1500-4000 operating hours per annum
MSUL/MSDL	Minimum start up load/minimum shut-down load
MWe	Mega Watt electrical generation supplied to the national grid.
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)
TNP	Transitional National Plan

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 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 11/12/14 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 turbines, proposed emission limits for each unit between the MSUL/MSDL and 70% load, with a justification.

The Regulation 60 Notice response from the Operator was received on 30/03/15.

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 on 15/6/15. Suitable further information was provided by the Operator on 07/09/15.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that determination.

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.

The LCP will be required to demonstrate compliance with the review of OCGT plant operating in the balancing market that is being conducted by DECC in 2015. Compliance with this review is likely to be implemented in further variations to the permit.

2.2 Requests for Further Information during determination

Although we were able to consider the Regulation 60 Notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment

In addition to the responses to our further information requests, we received additional information during the determination from the operator by e mail on 02/10/15 , confirming that the facility to fire the GT using fuel oil was required.

We made a copy of this information available to the public in the same way as the responses to our information requests.

2.3 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 requested were:

- TNP
- < 500 hrs limited operation derogation
- < 1500 hrs limited operation derogation
- Annex V ELV

We were only able to issue the variation notice for a single compliance route per LCP (other than TNP which can apply by pollutant), and the operator confirmed which route they wanted in the variation notice by email dated 21/12/15. The confirmed route was:

TNP compliance route

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.

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.	Not Applicable
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.	3.1.5 Schedule 3, Table S3.4
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;	Not Applicable
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	2.3.6 Schedule 1 Table S1.5
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	Not Applicable
Ann V Pt 1(6(1))	Definition of natural gas	Schedule 6, Interpretation
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

IED Article Reference	IED requirement	Permit condition
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 an updated LCP number in accordance with the most recent DEFRA reference numbers. The LCP references have changed as follows:

- **LCP 277** is changed to **LCP 296**

LCP 296

This LCP consists of 1 OCGT which vents via a single windshield at emission point A1. The units burn Natural Gas and distillate fuel oil as a standby fuel.

Compliance Route:

The operator has proposed to operate this LCP under the TNP compliance route.

The ELVs set in table 3.1 reflect the limits set in the permit prior to this variation.

For plant operating under the TNP, ELVs are set which have been derived for the period 2016 – 30 June 2020 (the duration of the TNP). At the end of this period it is expected that both Annex V and the revised LCP BREF will become applicable, in which case Annex V or the BAT conclusions must be achieved (whichever is stricter), or operators must have applied for a derogation from the BAT conclusion (if that is stricter: Annex V will apply in any event. The operator will apply, at the appropriate time, to vary the permit again to reflect this.

Net Rated Thermal Input:

The Applicant has stated that the Net Thermal Input is 134 MW_{th}. They have stated that this was derived from operating data obtained in 2005 using net Calorific value data and efficiency calculations, the details of these calculations have not been supplied. Improvement condition IC9 has been set to provide evidence for this test or to carry out a performance test by 31/12/16.

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 the electricity generated (MW); and this output is also expressed as a percentage of the rated output of the combustion plant (%).

The start-up and shut-down points represent the points at which the plant is stable and able to export power to the grid.

We agree with this definition and have set these thresholds in table S1.5 of the permit accordingly.

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.

The method used to derive the ELV's set in Table S3.1 is shown in Appendix 1.

The LCP will be subject to TNP/LLD compliance regime and the operator has confirmed that they will comply with the sector approach in the 2014 BAT review paper. Consequently we have set the emission limits for this LCP in line with the BAT paper in table S3.1, we have also set the standard annual emission target in table S3.4

For firing on natural Gas

Sulphur dioxide emissions from natural gas firing will be reported as six monthly concentrations 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. Dust emissions for will, likewise, be reported on the basis of emission factors without continuous or periodic monitoring. For gas turbines we have not required any reporting as the dust emissions will always be reported as zero. This is because natural gas is an ash-free fuel and high efficiency combustion in the gas turbine 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.

For firing on distillate fuel

Pre operational condition PO1 has been set to ensure that if the plant is prepared to use distillate fuel then the operator would have to propose monitoring and reporting arrangements for sulphur dioxide and dust that would meet the requirements of annex v of chapter III of the IED.

Consideration of the period between MSUL and 70% load and 70% load and MSDL.

The IED Annex V ELVs for oxides of nitrogen and carbon monoxide apply to OCGTs when the load is >70%. The MSUL and MSDL have been set at 70% of the rated output load in table S1.5. as this corresponds to the MSUL and MSDL points it has not been necessary to set ELVs for these periods.

Energy efficiency:

The installation does not have CHP. In line with the DEFRA Part A guidance, to report on the scope for further improvement, a condition 1.2.2 has been included for the operator to carry out a 4-yearly efficiency review.

Standby fuels:

The operator normally uses Natural Gas fuel and has applied to use distillate fuel oil as a standby fuel. Since it is BAT to use the cleaner gas fuel, gasoil use is limited to 2400 hours per year. This operating restriction on the use of distillate fuel was previously assessed under the existing permit and an impact assessment for short and long term effects was assessed as insignificant..

Additional measures for environmental protection were identified to be implemented when fuel oil was delivered to the site and these were noted in IC1. These requirements together with the requirements specified in IC 4 and IC5 have been incorporated into PO1 which will have to be completed before the site is permitted to undertake standby fuel firing.

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.

Monitoring & standards:

Standards for assessment of the monitoring location (measurement of oxygen, water vapour, temperature and pressure are included in the standard BS EN 14181 which is referenced in table S3.1 of the permit) have been added to the permit.

A row has been included in table S3.1 which requires the operator to confirm compliance with BS EN 15259 in respect of monitoring location and stack gas velocity profile in the event there is a significant operational change (such as a change of fuel type) to the LCP.

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.

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

Following flooding of the site in 2013 and 2014, the Operator reviewed the site drainage arrangements. This review concluded that the location of the surface water discharge point (W1) was contributing to the flooding problem by recirculating pumped water back upstream of the site. The Operator proposed to relocate the discharge to a new point (W2) downstream of the site. EA FCRM have been consulted about this change and neither they nor the site inspector have any objection (see EPR Compliance Assessment Report

ZP3130LJ/0223490, 02/10/14). As a simple efficiency, the new monitoring point has been introduced in this Variation.

Appendix 1

Method used to derive ELVs set in Table S3.1

method

- 1 no backsliding so do not set limits > present permit unless justified by operator.
- 2 back calculate using present permit limits and annex V ELV ratios
- 3 do not set tighter than annex v limits unless site specific requirement
- 4 if present permit tighter than annex v set to annex v unless option 3 applies
- 5 under TNP or < 1500 hrs set to permit limit calculation , round down to sensible number

daily annex v as 95% ile

TNP option	NOx Natural Gas				CO Natural Gas			
	hourly	daily	48 hourly as 95% ile	monthly	hourly	daily	48 hourly as 95% ile	monthly
Annex V	100	55		50	200	110		100
% of annex v monthly	200%	110%		100%	200%	110%		100%
in present permit	not set	60	60	not set	not set	100	125	not set
permit values by calc	109.0909091			54.5455	181.8181818			90.90909
SSE TNP proposal		as permit	as permit		as permit	as permit		
% of annex V	109%	109%		109%	91%	91%		91%
	Not Tighter than annex V				Tighter than annex V set to annex v under TNP			
proposed limits	set to permit limits under TNP option				set to permit limits under TNP option			
		110	60	55	200	110		100
	hourly at permit limits rounded to sensible number				hourly at annex v			
	daily at permit limits				daily at annex v			
	monthly same as daily annex v calc				monthly at annex v			

	Nox oil firing				CO oil firing			
	hourly	daily	48 hourly as 95% ile	monthly	hourly	daily	48 hourly as 95% ile	monthly
Annex V	180	99		90	200	110		100
% of annex v monthly	200%	110%		100%	200%	110%		100%
in present permit	not set	125	125	not set	not set	150	not set	not set
values by calc	227.2727273			113.636	272.7272727			136.3636
SSE TNP proposal		as permit	as permit			as permit	as permit	
% of annex V		126%		126%		136%		136%
	Not Tighter than annex V				Not Tighter than annex V			
proposed limits	set to permit limits under TNP option				set to permit limits under TNP option			
		225	125	110	270	150		135
	hourly at permit limits rounded down to 225				hourly at permit limits rounded down to 270			
	daily at permit limits				daily at permit limits			
	monthly at daily annex v calc rounded to 110				monthly at daily annex v calc rounded to 135			

