

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/HP3137ZK
The Operator is: INEOS Nitriles (UK) Limited
The Installation is: RWE Npower Cogen (INEOS Nitriles)
This Variation Notice number is: EPR/HP3137ZK/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 notice 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 the 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 response to the regulation 60 notice 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.

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

GLOSSARY

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
ELV	emission limit value set out in either IED or LCPD
ESI	Electricity Supply Industry
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
MSUL/MSDL	Minimum start up load/minimum shut-down load
NERP	National Emissions Reduction Programme
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

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 31/10/14 requiring the Operator to provide information for each LCP they operate, including:

- The type of plant, size and configuration.
- The proposed compliance route.
- 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 09/04/15.

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. Suitable further information was provided by the Operator on 10/07/15.

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.

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.	3.1.3, Schedule 3, Table S3.3
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	Not applicable
41(a)	Determination of start-up and shut-down periods	2.3.5, Schedule 1 Table S1.4
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 O ₂ 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	Not applicable
Ann V Pt 3(1)	Continuous monitoring for >100MWth for specified substances	3.5, 3.6, Schedule 3, Table S3.1
Ann V Pt 3(2, 3, 5)	Monitoring derogations	3.5.1, Schedule 3, Table S3.1
Ann V Pt 3(4)	Measurement of total mercury	Not applicable
Ann V Pt 3(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
Ann V Pt 3(7)	Monitoring requirements	3.5.1, Schedule 3, Table S3.1
Ann V Pt 3(8,9,10)	Monitoring methods	3.5, 3.6
Ann V Pt 4	Monthly, daily, 95%ile hourly emission limit value compliance	3.5.1, Schedule 3, Table S3.1
Ann V Pt 7	Refinery multi-fuel firing SO ₂ 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 LCP reference numbers. The LCP reference has changed as follows:

- **LCP237** is changed to **LCP271**

LCP271

The LCP comprises principally a single gas turbine (net thermal input of 131 MWth) with a heat recovery steam generator, a steam turbine and associated generating equipment. This LCP vents via a single, dedicated vent stack at emission point A1. The units burn natural gas only and does not use a standby fuel.

Because the prime purpose of this plant is to supply steam and electricity for the activities on this facility, even though it has the capability to export surplus electrical production to the National Grid, it is not considered to be an ESI plant.

Compliance Route

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

This installation is not part of the NERP programme.

Net Rated Thermal Input

The Applicant has stated that the Net Thermal Input is 131 MWth. They have justified this figure by providing information as follows:

Thermal input has been affirmed from a performance test dated 2010 ref PERF/031010 carried out by RWE Npower. Testing was carried out in compliance with the following standards:

- ISO 2314:1989. Specification for Gas turbine acceptance tests.
- ISO 5167-1/2/3/4:2003. Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full
- AGA8 - 1994/ISO 12213-1/2/3:1997. Natural gas - Calculation of compression factor.
- ISO 6976:1995. Calculation of Calorific Values, Density, Relative Density and Wobbe Index from Composition.

Test reports are available for inspection at site. We are satisfied that this represents a valid method of justification.

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 a question of the Reg 60, in terms of the output load (i.e. electricity, heat or power generated) in MW; and this output load as a percentage of the rated output of the combustion plant (%).

The operator has justified these values by providing several sets of data which demonstrate that 26 MWth represents a reasonable cut-off for the end of the start up sequence and the beginning of the shut-down sequence of the LCP. We agree with this method of validation and have set these thresholds in table S1.4 of the permit accordingly. Standard permit condition 2.3.5 has been set to define the period of start up and shut down, referring to the thresholds in this table.

Emission limits

For ELV Compliance Plant

For those substances not requested under the TNP route, we have incorporated ELVs into table S3.1 of the permit as follows:

Parameter	Existing mg/m ³	Reference Period	Annex V mg/m ³	New Permit limit mg/m ³
CO	100	Monthly mean of validated hourly averages	100	100
	None	Daily mean of validated hourly averages	110	110
	200	95% of validated hourly averages within a calendar year	200	200

- For CO emission limits, the parameter that is not included in the current permit (*Daily mean of validated hourly averages*) has been added to the reviewed permit using the factor defined in IED (ie 110% of the monthly mean of validated hourly averages).
- NOx is considered for TNP compliance (below).
- The operator did not propose limits for SO₂. We have accepted this as complying with IED but we have included a monitoring requirement, considered below, which has been incorporated into the permit as a requirement of IED.

For TNP compliance plant (NOx)

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.

In the situation of this operator, he has proposed limits that are higher than indicated in annex V of the IED and the 2014 BAT review paper (as shown in the following table):

Parameter	Existing mg/m ³	Reference Period	Annex V mg/m ³	New Permit limit mg/m ³
NOx	60	Monthly mean of validated hourly averages	50	60
	None	95% of validated daily means within a calendar year	55	66
	120	95% of validated hourly averages within a calendar year	100	120

Under TNP we have accepted the proposed limits and incorporated them into table 3.1 of the permit. The NOx parameter that is not included in the current permit (*95% of validated daily means within a calendar year*) has been added to the reviewed permit using the factors defined in IED (ie 110% of the monthly mean of validated hourly averages).

The IED Annex V ELVs for oxides of nitrogen and carbon monoxide apply to CCGTs 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 when the load varies between MSUL/MSDL and base load during the daily reference period.

Energy efficiency

The installation includes a CHP. In line with DEFRA guidance, to report on the scope for further improvement, condition 1.2.1 has been included for the operator to carry out a 4-yearly efficiency review.

Standby fuels

The operator does not use a standby fuel. Oil is used for a small combustion unit that is used for warming up the plant ready to commence production. No limits have been placed on oil usage because of the short durations of use.

Reporting efficiency

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

Notifications

Schedule 5, Part C, takes account of abatement equipment malfunction and breakdown requirements. As there is no abatement plant for this LCP, Part C is not required.

Monitoring & standards

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

Direct monitoring of sulphur dioxide and dust emissions have not been included in the monitoring regime. However:

- Sulphur dioxide emissions from natural gas firing of gas turbines and boilers 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

- For dust emissions from 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.

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

As this is a non-ESI plant, additional reporting metrics have not been included in the permit.

Additional IED Chapter II requirements

Condition 3.1.4 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.

Other conditions

This is a single operator installation covered by two permits (this permit and EPR/FP3435GZ); historically there were two separate operators. Conditions for a multi-operator installation are not required.