

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/DP3030XH
The Operator is: GREP1 Limited
The Installation is: Sleaford Renewable Energy Plant
This Variation Notice number is: EPR/DP3030XH/V006

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 the LCP. The response also includes specific details relating to the 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 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 the 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

| | |
|-----------|---|
| 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 |
| ELV | emission limit value set out in either IED or LCPD |
| 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 |
| MSUL/MSDL | Minimum start up load/minimum shut-down load |
| 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 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 17/12/14 requiring the Operator to provide information for the 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.

The Regulation 60 Notice response from the Operator was received on 31/03/15.

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. Suitable further information was provided by the Operator on 01/07/15.

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. | 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; | Not applicable |
| 37 | Provisions for malfunction and breakdown of abatement equipment including notifying the EA. | 2.3.6 4.2.6 4.3.1d |
| 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 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 | Not applicable |
| 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 | Not applicable |
| AnnV Pt3(4) | Measurement of total mercury | Not applicable |

| IED Article Reference | IED requirement | Permit condition |
|-----------------------|--|---------------------------------|
| 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

- Sleaford Renewable Energy Plant is a baseload biomass plant, which operates at high availability with limited periods of downtime. The operator was granted a permit before 7 January 2013, and was put in operation before 7 January 2014. Therefore, the permit must include conditions ensuring emissions into air from this plant do not exceed emission limit values set out in part 1 of annex V.
- The operator applied to vary the original permit in order to comply with the requirements of IED. In particular to comply with short-term emission limit values for oxides of nitrogen. In granting a variation to the original permit we were satisfied that exceedance of the relevant air-quality standards or environmental assessment levels were unlikely. The operator in the application recognised that the new emission limit values required by IED could not be met by combustion control alone. The combustion controls, therefore, must be supplemented by selective non-catalytic reduction (SNCR). An established technology whereby ammonia is injected into the combustion gases so that oxides of nitrogen can be converted to nitrogen water. The operator was granted an IED permit on 7 November 2013. However, this permit omitted the start-up / shutdown definition as required by the Implementing Decision 2012/249/EU.
- The key assessment within the determination was to ensure that appropriate measures had been used when determining the net rated thermal input of the plant and the use of an appropriate methodology for the definition of start-up and shutdown in accordance with Implementing Decision 2012/249/EU.
- The operator in the response to a request for further information on compliance with IED chapter III ELV's for Large Combustion Plant based his response on the design point of the boiler based upon EN 12952 – 15 using the losses method.
- The MSUL/MSDL figures provided were deemed satisfactory. The operator submitted values of load in MW and as percent of rated power output and three other criteria including the withdrawal of the start-up

burner, values for the steam temperature exiting the boiler and flue gas temperature downstream of the super heater.

- ELV's have been set in accordance with IED chapter III Annex V, hence adding the calendar monthly mean, which is a value equivalent to 50% of the value for 95% of validated hourly averages within a calendar year, this is an addition to those values in the existing permit.
- An existing emission limit value and monitoring requirement for NOx was retained reference to the daily mean of hourly averages (250mg/m³). This is consistent with the existing value and the 2014 BAT paper (no backsliding). The IED ELVs of 500mg/m³ were set for the 95th percentile of validated hourly averages within a calendar year, and 250mg/m³ for the daily mean of validated hourly averages.
- An existing emission limit value and monitoring requirement for sulphur dioxide (SO₂) was retained. This data was referenced in accordance with IED Chapter III Annex V. Calendar monthly mean, daily mean of validated hourly averages and the 95th percentile of validated hourly averages within a calendar year. Existing limit values were used following the 2014 BAT review paper.
- An existing emission limit value and monitoring requirement for carbon monoxide (CO) was retained. This data was referenced to the Daily mean of validated hourly averages and the 95th percentile of validated hourly averages within a calendar year.
- An existing emission limit value and monitoring requirement for Hydrogen Chloride (HCl) was retained. This data was referenced to the daily mean of validated hourly averages and the 95th percentile of validated hourly averages within a calendar year.
- A further requirement was included to monitor ammonia slippage from operation of the SNCR NOx abatement plant. However, no ELV was set. We have agreed that to understand the complexities of the operation of this abatement plant an existing improvement action (improvement condition, IC2) should be retained.
- Condition 3.7 was included to reflect the modern template approach to installations that receive waste material that may attract pests. This addition does not suggest that the current installation has a pest control problem but ensures that our regulatory approach to pest control is consistent across all similar permitted installations.
- A new improvement condition (IC3) has been included to review options for final ash disposal, including use as a soil conditioner or an agricultural fertiliser.

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 Department of Environment Food and Rural Affairs (DEFRA) LCP reference numbers. The LCP reference is as follows:

- **LCP412**

LCP412

This LCP consists of 1 x 118 MWth biomass fired boiler plant which vent via a single flue to its own dedicated windshield at emission point A1. The units burn straw and untreated woodchip with start-up fired on gas oil.

Compliance Route:

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

Net Rated Thermal Input:

The Applicant has stated that the Net Thermal Input is 118MWth. They have justified this figure by providing a performance test in accordance with EN 12952–15 using the losses method. This is acceptable to the Environment Agency.

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:

Minimum start up load in terms of

- (i) Output load (i.e. electricity, heat or power generated 11 MW)
- (i) Output load as a percentage of rated thermal output 35.7%

Minimum shut down load in terms of

- (i) Output load (i.e. electricity, heat or power generated 2.8 MW)
- (ii) Output load as a percentage of rated thermal output 35.7% (this reflects operation in “island” mode in respect of electrical output with a proportion of steam produced going to by-pass)

We agree with all of these definitions and have set these parameters and thresholds to reflect the technical characteristics of the plant that are met at the end of start-up and the start of shutdown. These are detailed in table S1.4 of the permit. 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:

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 3.1 of the permit. However, for determinands Ammonia, CO and HCl, where there are no limits set in Annex V of the IED,

and SO₂ where the limits are less stringent, the current permitted limits have been used in accordance with the 2014 BAT review paper i.e. no back-sliding.

LCP412

Release point A1:

| Parameter mg/m³ | Current limit mg/m³ | Annex V IED mg/m³ | Regulation 60 response | New Permit limit mg/m³ |
|---|---|---|-----------------------------------|--|
| NO_x Calendar monthly mean | - | 250 | Annex V IED | 250 |
| NO_x Daily mean of validated hourly averages | 250 | 275 | Annex V IED | 250 |
| NO_x 95% of validated hourly averages | 500 | 500 | Annex V IED | 500 |
| SO₂ Calendar monthly mean | - | 200 | Annex V IED | 100 |
| SO₂ Daily mean of validated hourly averages | 100 | 220 | Annex V IED | 110 |
| SO₂ 95% of validated hourly averages | 150 | 400 | Annex V IED | 150 |
| CO Daily mean of validated hourly averages | 375 | - | Annex V IED | 375 |
| CO 95% of validated hourly averages | 500 | - | Annex V IED | 500 |
| Dust Calendar monthly mean | - | 20 | Annex V IED | 20 |
| Dust Daily mean of validated hourly averages | 20 | 22 | Annex V IED | 22 |
| Dust 95% of validated hourly averages | 40 | 40 | Annex V IED | 40 |
| HCl Daily mean of validated hourly averages | 30 | - | Annex V IED | 30 |
| HCl 95% of validated hourly averages | 60 | - | Annex V IED | 60 |
| Ammonia | - | - | - | - |

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 has been included for the operator to carry out a 4-yearly efficiency review.

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, takes account of the malfunction and breakdown requirements. A breach of permit condition is NOT implicit in notification under Part C.

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.

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. For a new plant in pre-operational commissioning the same requirement applies.

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.